

***U.S. v. Microsoft*—an economic analysis**

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I. Background

In May 1998, the U.S. Department of Justice filed suit against the Microsoft Corporation claiming a number of violations of sections 1 and 2 of the Sherman Act.¹ The case was tried from October 19, 1998 through June 24, 1999. Judge Thomas Penfield Jackson ruled as to the findings of fact on November 5, 1999 and conclusions of law on April 3, 2000. At the time this article was drafted, the remedy phase of the trial was about to begin. If the case does not settle, the appeals process will follow.

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AUTHORS' NOTE: *This is an updated version of a paper with the same title that was published as an essay of the same title in a monograph Did Microsoft Harm Consumers: Two Opposing Views (AEI/Brookings Joint Center for Regulatory Studies, 2000).*

We are grateful to Jeffrey Blattner, David Boies, Timothy Bresnahan, Wayne Dunham, Joen Greenwood, Karma Giullianelli, A. Douglas Melamed, Diane Owen, Mark Popovsky, Mary Beth Savio and others for assistance and comments. None of the views expressed herein necessarily reflect their opinions or those of the Department of Justice.

¹ U.S. v. Microsoft, Civil Action No. 98-1232 (May 1998).

This article presents perspective and commentary on the economic issues from the viewpoint of two economists who were active in the case.² Fisher was one of the U.S. government's economic witnesses at the trial, and this article is based in part on his testimony. Rubinfeld was Deputy Assistant Attorney General (DAAG) for Economics in the Antitrust Division during much of the investigation, and DAAG and then consultant for the U.S. government during the trial. Our roles as testifying expert and chief economist at the Antitrust Division, respectively, carry with them the advantage of seeing the issues from the inside as participants, and the disadvantage that one's perspective is inevitably affected by one's own viewpoint. Because our goal is to explicate the merits of the government's case and to highlight important issues, we are hopeful that the advantages will outweigh any disadvantages. Most of what follows summarizes our views at the time of trial; subsections that contain retrospective commentary are noted.

II. Summary of opinions

Microsoft raised these basic economic questions:

1. Did the Microsoft Corporation possess monopoly power in the market for personal computer operating systems?
2. Did Microsoft maintain its monopoly power by anticompetitive conduct?
3. Did Microsoft use its monopoly power in an anticompetitive way to distort competition in markets other than the market or markets for personal computer operating systems?
4. Did Microsoft engage in unreasonable restraints of trade?

The answer to the fourth question involves both section 1 and section 2 of the Sherman Act. In this presentation, we will put particular emphasis on section 2. In general, a violation of section 2 requires both the possession of monopoly power and its acquisi-

² The article expands on a shorter commentary and reply that appear on the AEI/Brookings Joint Center for Regulatory Studies Web site <www.aei.brookings.org/publications>.

tion or maintenance by acts not consistent with competitive profit-maximizing behavior.

Our answers to these central questions are that:

Microsoft achieved monopoly power in the market for operating systems for Intel-compatible desktop personal computers.

Microsoft foresaw the possibility that the dominant position of its Windows operating system would be eroded by Internet browsers and by cross-platform Java, both of which are capable of supporting software applications that are operating-system independent.

Microsoft took anticompetitive actions (that were ultimately successful) to exclude competition in Internet browsers in order to protect its dominance of its Windows operating system.

Microsoft also took anticompetitive actions to restrain the use and availability of the cross-platform Java technology in order to protect the current dominance of the Windows operating system. Further, Microsoft engaged in a number of anticompetitive acts and solicitations designed to convince other firms not to compete against Microsoft in platform-level software.

Microsoft used its monopoly power over personal computer (PC) operating systems to distort competition in Internet browsers.

Microsoft's conduct, which preserved and increased barriers to entry into the PC operating system market, included:

- a. Tying its browser to the operating system (in effect requiring manufacturers to acquire Microsoft's Internet browser as a condition of acquiring Microsoft's Windows operating system), thereby severely hampering Netscape in browser competition and blunting the threat that software developers, writing for a browser platform, would write for one not under Microsoft's control;³
- b. Excluding browser competitors from the most efficient channels of distribution, thereby requiring competitors to use more costly and less efficient channels;

³ In general it takes less to prevent Netscape's browser from evolving into an alternative platform than it does to monopolize the browser market. We do not discuss the latter issue in this article.

- c. Imposing agreements requiring original equipment manufacturers (OEMs) to neither remove Microsoft's browser, nor to substitute an alternative browser;
- d. Imposing agreements on online services, Internet service providers, and Internet content providers, requiring them to boycott or disfavor Netscape and other browsers (including agreements not to promote, distribute, use, or pay for Netscape's browser—or to do so only on less favored terms), thereby further excluding competition;
- e. Giving its browser away for free (committing itself to do so "forever"), and, indeed, paying others to take its browser; and
- f. Containing the cross-platform threat of Java by growing "polluted" Java, designed to entrap software developers into writing Java programs that would not run except with Windows.

The principal effect of Microsoft's anticompetitive conduct was the maintenance of Microsoft's operating systems monopoly. Absent an appropriate remedy, platforms that do not use a Microsoft standard will not prosper, and a critical opportunity for innovation that reduces or eliminates Microsoft's power will have been lost.

Further, to the extent Microsoft is unchecked in its anticompetitive actions, the incentive of other firms to innovate in areas competitive with Microsoft will be reduced. Thus, if software developers believe that Microsoft will engage in anticompetitive acts to impede any innovation that threatens its monopoly, they will have substantially reduced incentives to innovate in competition with Microsoft. As a result, the range of software products from which consumers can choose will be limited, reducing consumer welfare.

*What the case was not about*⁴

It is important to highlight what the case was *not* about. First, the case was *not* brought because Microsoft was innovative. Indeed, it was not brought because Microsoft's innovations happened to bring with them monopoly power. It was brought

because Microsoft took anticompetitive actions to maintain that power—actions that were not separately profitable innovations, but were actions that prevented competitive innovations from getting a fair market trial.

Second, some commentators have expressed the view that the risk of inappropriate antitrust enforcement is too great in an innovative, dynamic industry such as computer software. To the contrary, we believe that because of the central and essential role the PC operating system plays (and is expected to play) in both commercial and consumer endeavors (including access to the Internet and the World Wide Web), the costs of improperly maintaining monopoly power over the operating system, and the danger that Microsoft's existing monopoly power will be used to monopolize other critical markets that are linked to the operating system, were, and are very great.

For example, to the extent that (as discussed below) Internet browsers and/or Java in fact threatened to undermine and, indeed, actually undermined Microsoft's operating system monopoly—by eroding the applications barrier to entry that protects the monopoly—there are substantial economic costs to permitting Microsoft to rebuild and protect that barrier by stifling non-Microsoft browsers and cross-platform Java and, more generally, platform innovations that threaten Microsoft.

Third, this was not a case about bundling any two products together so as to leverage an existing monopoly. The government did not claim that Microsoft attempted to utilize its existing monopoly power over PC operating systems to monopolize the market for Internet browsers for its own sake. Rather, it claimed that Microsoft's goal was to maintain its operating systems monopoly. If it were successful in achieving its goal, the economic costs to consumers and the economy would be substantial.

Finally, a number of commentators have suggested that the government's case was weak or incomplete because it failed to show immediate consumer harm. In fact, the government did present evidence of immediate harm, which we spell out later in the

⁴ This subsection contains retrospective commentary.

article. In any case, we disagree with these commentators, for a number of reasons:

First, antitrust law does not require proof of such harm. It merely requires proof of harm to competition on the general presumption that this, in turn, leads to harm to consumers.

Second, to require such proof would be to immunize any predatory practice. For example, during a predatory pricing campaign, consumers are benefited by the predatorily low price; the harm comes in the resulting effects on competition. This point goes beyond pricing. In dynamic, innovative industries, initial consumer benefits can lead to later consumer harm if the pattern of product innovation, pricing, and quality is adversely affected by the improper use of monopoly power.

Third, the fact that innovation can bring consumer benefits should not provide a license for innovative firms to engage in anticompetitive acts.

III. The economics of competition and monopoly

We begin our analysis by laying out some basic issues relating to the economics of PC operating systems and applications, after which we concentrate on the antitrust implications of a number of Microsoft's actions.

It is worth noting at the outset that the answer to the question of whether Microsoft has monopoly power in the market for PC operating systems is significant in answering each of the three economic questions with which we began. One important reason is that the effect of certain conduct by a firm depends on whether the enterprise engaging in it has monopoly power. For example, if an enterprise without monopoly power engages in tying (or other restrictive practices), customers who would prefer not to purchase the tied combination can decline to buy from the company. If there is effective competition in the market for the tying product, and if there is a separate demand for a component of a tied combination sufficient to make it efficient to supply that component separately, we would expect competitors to offer both the tying

and the tied components of the combination separately. However, if an enterprise that is engaged in tying possesses monopoly power over the tying product, customers will not have realistic competitive alternatives and will be unable practicably to procure the tying product separately from the combination. Moreover, if the enterprise engaged in tying both has monopoly power over the tying product and ties a sufficient quantity of the tied product so that there is no longer sufficient demand to support viable alternative suppliers of the tied product, the enterprise engaged in tying will achieve a dominant position in the supply of the tied product as well. (If there are significant barriers to entry in the market for the tied product, that dominant position will result in the enterprise's achieving monopoly power over the tied product also.)

Similarly, analyzing the effect of conduct on either maintaining existing monopoly power or on securing monopoly power where such power does not exist may be useful in assessing whether the conduct is anticompetitive or exclusionary. This is not, of course, to say that all conduct that secures or maintains monopoly power is anticompetitive. Certain conduct (e.g., non-predatory price competition or product improvements) is so important to the competitive process, and the potential costs of interference are so high, that it is considered competitive (and not anticompetitive) even where it results in securing or maintaining a monopoly. However, certain conduct that may be benign (or at least tolerated) if it does not maintain or create monopoly power, is clearly recognized to be anticompetitive where it has such an effect.

Market power is the ability of a seller of a product to profitably maintain prices above competitive levels. Monopoly power is a substantial degree of market power. While a firm with a slight degree of market power may find it profitable to charge supranormal prices for a short time or to charge prices that are only slightly supranormal, a firm with monopoly power will find it profitable (a) to charge a price significantly in excess of competitive levels, and (b) to do so over a significant period of time.

It is important to stress that success achieved through legitimate means such as innovation, superior marketing, or historical accident may naturally give rise to market power or even monopoly power. The very fact that the software industry is so innovative, together with its immense and growing importance in the American economy, makes it crucial that success be restricted to success on the merits, and that monopoly power be confined to that which results from that success. Even a firm that has attained monopoly power through legitimate means and natural economic effects must not be permitted to retain or extend that power through artificial, anticompetitive means.

Our analysis of competition and monopoly in *Microsoft* involves the following questions:

- a. How does one identify monopoly power?
- b. What is the role of network effects?
- c. What is an anticompetitive act?
- d. How can a firm with monopoly power in one market use that power to gain advantages in other markets in ways that are both anticompetitive and serve to protect or extend the firm's power in the first market?

A. *How does one identify monopoly power?*

The hallmark of monopoly power is the absence or ineffectiveness of competitive constraints on price, output, product decisions, and quality. In general, the issue of monopoly power is addressed by defining "the relevant market" and assessing shares in that market. This is at least a beginning guide to the presence or absence of market power, and a way of organizing the facts that one will have to take into account.

Because its purpose is the identification of monopoly power, if it exists, the definition of relevant market should include all those products that reasonably serve to constrain the behavior of the alleged monopolist. Such constraints arise from three sources: substitution by consumers to other products (demand substitutability); substitution by producers to other products (supply substitutability); and entry of new productive capacity.

These principles have long been recognized. Since 1982, the Department of Justice's Merger Guidelines have approached market definition in merger cases by asking in part whether a single, profit-maximizing firm controlling a candidate market could raise price from the *prevailing* level by a significant amount (i.e., 5 percent), for a nonnegligible time period.⁵ When the issue is instead whether a particular firm possesses market power or monopoly power, it is necessary to consider raising price *from the competitive level*.⁶

Having defined an appropriate market, one then goes on to consider market share and the ability of firms not in the market to enter, in the event of an attempt by the alleged monopolist to earn supranormal profits through an exercise of power. A key distinguishing feature of monopoly power is its durability. If an attempt by a firm to earn supranormal profits by pricing above competitive levels would be rapidly frustrated by entry, that firm does not possess monopoly power.

Barriers to entry are factors that would prevent entry in the face of supranormal profits. (These factors also limit the expansion of existing firms.) Where there are significant barriers to entry, monopoly power can be present; otherwise it cannot.

B. *What is the role of network effects?*

The barriers to entry in the present case stem from a combination of economies of scale and network effects, and from the fact that programs written to run on a given operating system will generally not run on others unless considerable expenditures are undertaken.

⁵ U.S. Department of Justice, Merger Guidelines § I (1982), *reprinted in* 4 Trade Reg. Rep. (CCH) ¶ 13,102; U.S. Department of Justice and Federal Trade Commission, Horizontal Merger Guidelines § 1.0 (1992), *reprinted in* 4 Trade Reg. Rep. (CCH) ¶ 13,104.

⁶ Note that this need not require a quantitative estimate of the competitive price level; in intellectual property, in particular, where marginal costs are close to zero, that level may be difficult to determine. Nevertheless, as was true in *Microsoft*, it may be easy to use the testimony of customers to decide that a firm has the power to raise price above already remunerative levels.

Like all software, applications programming exhibits substantial economies of scale, because most of the costs come in the creation of the software and are independent of the number of copies that are produced. Hence software developers wish to write for operating systems (or other platforms) that have a large number of users.

Network effects arise when the attractiveness of a product to customers increases with the use of that product by others. Indeed, the fact that many applications are written for a given operating system and cannot easily run on other operating systems makes that operating system more attractive to users. Interestingly, the importance of the availability of applications for operating systems networks has prior to this case been unappreciated.⁷

Taken together, these network effects and scale economies create a positive feedback: the more users an operating system has, the more applications will be written for it; the more applications written for an operating system, the more users it will acquire. After this feedback effect has operated for a while, it becomes difficult or impossible for a new operating system to make much of an inroad.

In these circumstances, it is natural for one firm to become dominant in operating systems, acquiring monopoly power. However, the fact that the successful firm has acquired monopoly power with a "natural" barrier to entry does not justify its taking anticompetitive acts to extend that power to another market or, in particular, its engaging in anticompetitive acts that serve to buttress and protect its power in the original market.⁸

⁷ Network effects are broadly discussed in Michael L. Katz & Carl Shapiro, *Antitrust in Software Markets*, in *COMPETITION: INNOVATION AND THE MICROSOFT MONOPOLY: ANTITRUST IN THE DIGITAL MARKETPLACE* (Jeffrey A. Eisenach & Thomas M. Lenard eds., Progress and Freedom Foundation, 1999).

⁸ For a broader discussion of the implications of network effects, see Daniel L. Rubinfeld, *Antitrust Enforcement in Dynamic Network Industries*, 43 *ANTITRUST BULL.* 859 (1998).

C. *What is an anticompetitive act?*

In the case of a single firm, anticompetitive acts typically involve the taking of measures that are more restrictive of competition than necessary. In our view, a predatory anticompetitive act is an act that (a) is not profitable in the long run without accounting for the supranormal profits that can be earned because of the adverse effects on competition; and (b) *is* profitable in the long run *only* when taking into account the supranormal profits to be earned because of the adverse effects on competition.⁹

In effect, a predatory anticompetitive act is one that involves a deliberate sacrifice of profit in order to secure or protect monopoly power. A firm that takes an action not expected to be profit-maximizing, save for the monopoly rents that stem from the act's effects on competition, is using its assets in a way that incurs an opportunity cost—a sacrifice of profits that could have been made had the firm taken a profit-maximizing action.¹⁰ If the firm does this in order to earn supranormal profits dependent on the effects of its actions on competition, then that firm has taken an action that is not profitable except for those effects, and is anticompetitive.¹¹

It should be noted that an otherwise procompetitive act that is more restrictive than necessary will be anticompetitive under this

⁹ The second part of the definition is useful to distinguish a predatory anticompetitive act from one that merely turns out to lose money *ex post*.

¹⁰ The expected profits would necessarily take into account uncertain future streams of income, such as the payoffs from research and development.

¹¹ The standard tests of predatory anticompetitive acts are not conceptually at odds with this definition. Areeda-Turner, for example, proposes a test for a single-product firm in terms of price and average variable cost, but, as long as the measure of cost reflects opportunity cost, the test becomes an important application of the general principle. See, Phillip E. Areeda & Donald F. Turner, *Predatory Pricing and Related Practices Under Section 2 of the Sherman Act*, 88 *HARV. L. REV.* 697 (1975). Furthermore, the Areeda-Turner article discusses predatory pricing, which is merely one type of predatory anticompetitive act.

definition. The decision to do things in a way more restrictive than necessary will itself be an act that is not profitable except for the supranormal profits to be earned as a result of the adverse effects on competition.¹²

D. Extending and protecting monopoly

A firm with monopoly power may choose to exercise that power in ways other than by immediately charging monopoly prices. In particular, such a firm, even while earning supranormal profits in a given market, may choose to exercise its power to gain an advantage or even a monopoly in a second market. It is important to understand the circumstances under which such an action can have anticompetitive consequences.

Suppose that product *A* and product *B* are used together, and begin by supposing that such use involves fixed proportions; that is, a fixed amount of *A* must be used with each unit of *B*. In such a case it might appear that the *A* monopolist has nothing to gain by extending its monopoly into *B*. But such an appearance would be illusory because there are circumstances in which the extension of the *A* monopoly into the market for *B* could enable the original *A* monopolist to garner additional supracompetitive profits. For example, if *A* has other uses than that associated with *B*, then the charging of a high price for *A* risks losing customers for those other uses. The monopolist may be able to do better by charging a relatively low, uniform price for *A* and ensuring that it is the only source for *B*.¹³ Another possibility is that by extending its monopoly into the market for *B*, the original monopolist may be

¹² It is also worth noting that our definition would not make limit pricing anticompetitive if the limit price were itself profitable without regard for monopoly rents to be earned when the entry threat is thwarted. In that case, the limit price would not prevent entry by equally efficient firms.

¹³ This is related to the classic "metering" case in which the monopolist of *A* and *B* price discriminates, charging a low price for *A* to keep the business of highly price-responsive consumers of *A*, and extracts additional profit from less price-responsive users of *A* and *B* together by charging a high price for *B*.

in a position to earn supracompetitive profits in related markets in which *B* is used as an input.

Beyond all this, there is another very important possibility. If extending a monopolist's power from *A* to *B* can prevent others from entering *A*, then such an action will serve to maintain the *A* monopolist's original power. This could happen as follows. Suppose firms that produce *B* obtain technology or know-how, or gain access to customers that assist them in producing (or selling) *A*. Or suppose that *B* could be used by potential competitors of *A* to overcome barriers to entry in the supply of *A*. In such cases, and others, gaining control of the *B* business can create a barrier to entry in the *A* market.

Indeed, such an example is directly on point for the present case. Suppose that firms can somehow use *B* to facilitate the creation of a substitute for *A*. Then the *A* monopolist will gain from keeping or driving firms out of the production of *B*. *If it does so through acts that are not profitable save for the preservation of the A monopoly, then those acts are predatory and anti-competitive.*

In general, extending one monopoly to encompass a second market can be anticompetitive under either of two circumstances. The first such circumstance is one in which a firm uses its power in one market to organize a second market, permitting the earning of supranormal profits that would not otherwise be available. The second circumstance is one in which the extension of power to a second market serves to protect monopoly power in the first market by inhibiting entry.

IV. Economic analysis of Microsoft's actions

A. Monopoly power

Microsoft possesses monopoly power in the market for operating systems for Intel-compatible desktop PCs.¹⁴ Evidence presented in *Microsoft* showed that for the past few years, and for the

¹⁴ Judge Jackson agreed, finding that the relevant market is the licensing of all Intel-compatible PC operating systems worldwide (¶ 18).

reasonably foreseeable future, there have been and will be no reasonable substitutes for Microsoft's Windows operating systems for Intel-compatible desktop PCs. For example, numerous representatives from personal computer OEMs—the most important direct customers for PC operating systems—testified that OEMs do not believe they have any alternative to the acquisition and installation of Microsoft's Windows operating system. They would continue to take Windows even at a 10% price increase, and did take it even though some of them vigorously objected to the restrictions that Microsoft imposed on them.¹⁵ For example, John Romano of Hewlett Packard wrote to Microsoft in this regard that “if we had another supplier, I guarantee you would not be our supplier of choice.”¹⁶

Microsoft's share of PC operating systems is very high and has remained stable over time. Microsoft's worldwide share of shipments of Intel-based operating systems had been 90% or more in recent years.¹⁷

It is instructive to note that Microsoft's monopoly power is not much affected by the existence of Apple. Even though new users (and perhaps some existing ones) choose between PCs and Apple machines, a substantial increase in the price of Windows, say 10%, corresponds to only a small increase in the price of a PC and will make few, if any, users switch. Moreover, this case is about operating systems, not PCs; it is irrelevant whether there even exists a separate market for PCs.

Looking forward, for similar reasons, the possibility that non-desktop devices such as the Palm Pilot may partially substitute for the PC instead of remaining a complement for it also does not limit Microsoft's monopoly power in operating systems for the PC. It is simply not credible that a 10% increase in the price of

Windows would make a large number of users choose Palm Pilots rather than PCs. Even if nondesktop devices become serious substitutes for them (and this is doubtful), that would merely make Microsoft's monopoly less important; it would not make it disappear. And, of course, such a phenomenon would, in any case, not bear on the question of whether Microsoft *had* monopoly power in the period preceding the antitrust case.

In any event, even if non-Intel-based machines are included in the operating-system market, Microsoft's share has been high and stable, since Apple accounts for only about 12% of all PCs. Moreover, while Microsoft's high market share is indicative of its monopoly power, the direct evidence of the OEMs shows the existence of that power, and the analysis of barriers to entry confirms it.

As mentioned above, operating systems are characterized by network effects. Users want an operating system that will permit them to run all the applications programs they want to use; developers tend to write applications for the most popular operating system; and applications software written for a specific operating system cannot run on a different operating system without extensive and costly modifications or add-ons. (Operating systems provide application programming interfaces (APIs) through which applications interact with the operating system and, through the operating system, with the computer hardware. Applications developers must write their programs to interact with a particular operating system's APIs. The time and expense of then “porting” the application to a different operating system can be substantial. An API set to which applications may be written is often referred to in the industry as a “platform.”)

There are other network effects as well. For example, operating systems are complex; they exhibit network effects in part because firms are reluctant to reinvest in retraining workers, and in part because using multiple operating systems vastly increases technical support costs. This gives firms an incentive to have the same operating systems for all of its own computers and the same operating system that is widely used by other firms. Other net-

¹⁵ See, e.g., John Romano 4/13/98 Dep. Tr. at 50 (Hewlett-Packard); Bart Brown 3/5/98 Dep. Tr. at 10–11 (Gateway); James Von Holle 9/19/97 Dep. Tr. at 12–13 (Gateway); Jon Kies 4/23/98 Dep. Tr. at 8 (Packard Bell); Stephen Decker 10/17/97 Dep. Tr. at 11–12. (Compaq).

¹⁶ Government Exhibit 309.

¹⁷ See, e.g., Plaintiff's Trial Exhibit 1.

work effects include the ease of exchanging files and the opportunity to learn from others.

As the result of economies of scale and network effects, Microsoft's high market share has led to many more applications being written for its operating system than for any other. This has reinforced and increased Microsoft's market share, leading to still more applications being written for Windows than for other operating systems, and so on. This positive feedback effect—the applications barrier to entry—has made it difficult, or impossible for rival operating systems to compete effectively with Microsoft to gain more than a niche in the market. Microsoft's share and power was not likely to be eroded by new entry as long as the applications barrier to entry remained strong—a conclusion also supported by Microsoft's internal documents and other evidence.¹⁸

There was substantial evidence that Microsoft did not consider other operating systems vendors as a material constraint on its pricing of the Windows operating system.¹⁹ Nor did Microsoft view as an immediate threat, the possibility that a new technology would leapfrog its current and planned operating systems technologies.²⁰

¹⁸ On the applications barrier to entry, *see, e.g.*, Ron Rasmussen 7/10/98 Dep. Tr. at 67 (SCO); James Von Holle 9/19/97 Dep. Tr. at 9 (Gateway); Frank Santos 4/13/98 Dep. Tr. at 9 (Hewlett-Packard); Brad Chase 3/25/98 Dep. Tr. at 97 (Microsoft).

¹⁹ For example, Joachim Kempin, senior vice president of OEM sales at Microsoft, testified that he set the royalty rates for Windows 98 and that he never thought about looking at other vendors (Joachim Kempin 3/18/98 Dep. Tr. at 75–78). When Windows 98 came out, the royalty rates for Windows 95 went *up* to match those for the new operating system.

²⁰ In a December 1997 memorandum about potential competition that could affect Microsoft's OEM pricing strategy, Kempin described for Bill Gates the barriers to entry for OEMs that might be interested in entering the market: "Our high prices could get a single OEM (Compaq might pay us 750M\$ next year) or a coalition to fund a competing effort (say in India). While this possibility exists I consider it doubtful even if they get a product out that they can market it successfully, leapfrog us

Microsoft argued that it faced competition from its own installed base. However, because of the absence of other competition, it does not follow that whatever constraint its own installed base posed was sufficient to prevent Microsoft from having monopoly power; indeed, the contrary is the case. New operating systems are principally acquired in connection with the purchase of new computers and only secondarily in connection with upgrades. At best, Microsoft's installed-base argument relates to its pricing of upgrades. It does not apply to the more important channel of new computers, which are bought largely to take advantage of developments in hardware or software. The fact that a given user has an old operating system will not do much to keep that user from changing computers when hardware or software improves, and a new computer is required to use those improvements.

Moreover, Microsoft took actions to ensure that installed-base competition was minimal. Microsoft's licenses preclude customers from transferring their licenses to other PCs. This both limits installed-base competition as new PCs are bought and prevents development of a secondary market in licenses that would permit OEMs to acquire them as an alternative to licensing the use of Microsoft's newest version of its operating system. Microsoft's contracts with OEMs also generally prohibited them from shipping PCs to consumers with earlier versions of Microsoft's operating system once a new version was released.

Despite all the evidence described above, Microsoft denied that it has monopoly power. In its defense Richard Schmalensee used the standard static model for short-run monopoly pricing as one basis for his conclusion that Microsoft lacks such power. He

and would not deviate from their own standard to differentiate. Could they convince customer to change their computing platform is the real questions. The existing investments in training, infrastructure and applications in windows computing are huge and will create a lot of inertia. No bundling of OS [operating system] on low end systems would be the easiest way to hurt us—but who would want to start with this and lose business?" (12/16/97 re "As promised OEM pricing thoughts," Joachim Kempin to Bill Gates et al.: Pl. Ex. 365, at MS7 007196)

assumed that monopoly power existed, estimated the elasticity of demand for Windows by starting with the elasticity of demand for PCs and the fact that PCs and Windows are typically sold together, took the marginal cost of Windows as approximately zero, applied the formula, and derived the short-run monopoly price for Windows. Finding that the result was in excess of the actual price (around \$60) by some \$1800, he concluded that the assumption of monopoly power must be in error.

We do not agree with this analysis. Apart from the fact that the calculations contained a number of material errors, the entire train of logic is not correct. Since its marginal cost is essentially zero, the short-run profit-maximizing action for Microsoft is to price where the elasticity of demand that it faces is unity. *This is true whether or not Microsoft has monopoly power.* It is not credible (and is inconsistent with the evidence) to suppose that this is the case at a price of around \$60, since that would imply a loss of 10% of Windows sales if the price were increased by \$6. Yet, substantial evidence was presented at trial that OEMs would not shift to another operating system even if the price of Windows rose significantly. Further, it is implausible that the OEMs' own sales would drop by a significant amount. The correct conclusion must surely be that something other than short-run profit-maximization is happening. Microsoft is simply taking its profits in other ways.

Effectively, Professor Schmalensee's logic is that monopoly power plus short-run profit-maximization implies a price higher than observed. He concludes that there is no monopoly power. But (even apart from the errors in the calculation) the correct conclusion is that Microsoft is not maximizing its short-run profits.

We believe that Microsoft's pricing of its operating system (in particular its contractual prices to OEMs) is consistent with long-run profit-maximization by a firm with monopoly power.²¹ It is

²¹ Judge Jackson agreed, stating that "Viewed together, three main facts indicate that Microsoft enjoys monopoly power. First, Microsoft's share of the market for Intel-compatible PC operating systems is extremely large and stable. Second, Microsoft's dominant market share is protected by a high barrier to entry. Third, and largely as a result of

possible, indeed likely, that Microsoft is not maximizing its short-run profits in its operating system pricing. In a network industry, it is in a dominant firm's interest to account in its pricing strategy for a host of factors that could lead, other things being equal, to a lower price than one would expect from a simple short-run theory. These factors, which are not fully reflected in Professor Schmalensee's analysis, include (1) the value of keeping and growing one's installed base, the source of the significant network effects; (2) the possibility of creating increased demand for complementary applications, which in turn provides an additional revenue source; (3) the need to discourage software pirating; and (4) the imposition of onerous restrictions on its OEM customers as part of its anticompetitive campaign (discussed below) to preserve its long-run monopoly profits.

B. Netscape's browser posed a threat to Microsoft's operating system monopoly

1. INTERNET BROWSERS Microsoft interfered with competition in Internet browsers. Before Microsoft gave away its browser for free, a price for browsers was determined in this market and the market could have continued to perform this function. The demand for browsers was substantial and separate from the demand for operating systems. Indeed, browsers have been distributed separately from the operating system by both Internet Service Providers (ISPs) and retailers.²²

that barrier, Microsoft's customers lack a commercially viable alternative to Windows." (¶ 34)

²² For example, Cameron Nyhrvold, Microsoft vice president of the Internet customer unit, explained that ISPs distribute IE as a stand-alone product (4/24/98 Dep. Tr. at 26-29). For evidence of a demand for OS's with a choice of browser, see, e.g., John Kies of Packard Bell NEC (9/11/98 Dep. Tr. at 25); Eric Browning of Micron Electronics (10/14/97 Decl. ¶ 9; Richard Brownrigg of Gateway (3/5/98 Dep. Tr. at 27); and for demand without a browser, see Joseph Kanicki of Dell (4/29/98 Decl., ¶ 2); David Limp of Network Computer, Inc. (7/39/98 Dep. Tr. at 124); and John Kies of Packard Bell NEC (Dep. Tr. at 25).

Barriers to entry (including network effects and the results of Microsoft's conduct) exist, which prevent companies that might be able to produce a browser from entering and doing so. Indeed, by bundling its browser with its operating system and giving away its browser for "free," Microsoft effectively prevented companies from successfully entering the browser market unless they successfully entered the operating system market at the same time.

Microsoft did this not to achieve monopoly (or, indeed, any) profits in browsers, but rather to protect its monopoly in operating systems.

2. NETSCAPE'S BROWSER THREATENED TO ERODE THE APPLICATIONS PROGRAMMING BARRIER TO ENTRY Microsoft recognized that the dominant position of its Windows operating system could be threatened by an Internet browser that was capable of supporting applications that are operating-system independent.²³ To the extent that browsers themselves expose APIs, they support applications independent of the operating system. Therefore, by lessening reliance on the operating system, the browser, while not performing all the traditional functions of an operating system, could provide opportunities for competing operating systems by reducing the applications barrier to entry that protects Microsoft's operating system monopoly.

This threat was real because the Navigator browser runs on many different operating systems, including Windows, the Apple Macintosh operating system, and various flavors of UNIX. Netscape's browsers contain their own set of APIs (as well as a set of Java APIs) to which applications developers can write their appli-

²³ The court found that "the growth of server- and middleware-based applications development might eventually weaken the applications barrier to entry. . . . But, . . . it is not clear whether ISVs [independent software vendors] will ever develop a large, diverse body of full-featured applications that rely solely on APIs exposed by servers and middleware. Furthermore, even assuming that such a movement has already begun in earnest, it will take several years for the applications barrier to erode enough to enable a non-Microsoft, Intel-compatible PC operating system to develop into a viable alternative to Windows." (¶ 56)

cations. As a result, applications can be developed that will run on browsers regardless of the underlying operating system.

It is important to note that the "natural" applications barrier to entry would not protect Microsoft from such a development. Unlike a rival operating system, Netscape's Navigator provided an application—a complement to the operating system. Since Internet browsing was becoming extremely popular, computer users would acquire Navigator to use that application. If that occurred, then it would become increasingly attractive for software developers to write to the Navigator APIs, and computer users would care less and less about the underlying operating system.

Similarly, browsers could have reduced the power of the operating system monopoly by facilitating the expansion of network computing, in which users with "thin clients" use a network to access applications residing on a server computer, rather than hosting the application on the PC itself. Microsoft's own documents show a constant awareness of browsers as a serious threat to Microsoft's operating system monopoly, and its executives expressed in both depositions and internal documents their concern that browsers would weaken Microsoft's control of the platform.²⁴

²⁴ As early as May 1995, Ben Slivka, at that time a Microsoft project leader for Internet Explorer, noted "My nightmare scenario is that the Web grows into a rich application platform in an operating system-neutral way." (5/27/95 "The Web is the Next Platform (version 5)," Pl. Ex. 21, at MS98 0102395-6) Similarly, in his "FY 97 Planning Memo: 'Winning the Internet platform battle,'" Brad Chase of Microsoft wrote: "This is a no revenue product, but you should worry about your browser share, as much as BillG because . . . we will lose the Internet platform battle if we do not have a significant user installed base . . ." (4/4/96 "FY97 Planning Memo: 'Winning the Internet platform battle,'" Brad Chase to FY97 WWSMM Attendees: Pl. Ex. 39, at MS6 5005720); similarly, in a slide presentation for the "IPTD Division Meeting," Brad Silverberg, then senior vice president of the Internet platforms and tools division at Microsoft, wrote: "The Internet Battle: This is not about *browsers*. Our competitors are trying to create an alternative *platform* to Windows®" (4/25/96: Pl. Ex. 40, at MS6 6005550)

(footnote 24 continued)

3. BROWSERS COULD DEVELOP INTO ALTERNATIVE OPERATING SYSTEMS Microsoft was also concerned that browsers could ultimately develop into operating systems. For example, in April 1996, Bill Gates wrote that:

Netscape's strategy is to make Windows and the Apple Macintosh operating system all but irrelevant by building the browser into a full-featured operating system with information browsing. Over time Netscape will add memory management, file systems, security, scheduling, graphics and everything else in Windows that applications require.

The company hopes that its browser will become a de facto platform for software development, ultimately replacing Windows as the mainstream set of software standards. In Netscape's plan, people will get rid of their existing PC and Mac applications in favor of new software that will evolve around the Netscape browser.²⁵

As Ben Slivka of Microsoft explained:

So the point is not that the little tiny Web browser, you know, whether it was Navigator 1 or Navigator 2 or Navigator 3, the point was not that that thing by itself as it stood then would immediately kill Windows. That wasn't the point. The point was that that thing could grow and blossom and provide an application development platform which was more popular than Windows. So let me just take you through the scenario about how this happens.

So Microsoft does nothing about the Web, and Netscape has its browser and continues to enhance that and refine that. It gets developers to write tools that target the Netscape platform, both their Web-

The browser could also have threatened the operating system monopoly by providing an alternative user interface. As a result, browsers could have reduced consumers' resistance to non-Windows operating systems and enabled businesses to use different operating systems. In turn, this would have reduced Microsoft's power to exploit the value of its interface real estate by requiring other companies to promote Microsoft's products through exclusive agreements. (Brad Chase 3/25/98 Dep. Tr. at 39) Microsoft was also concerned that browsers could develop into an alternative software development platform that could replace Windows. (Bill Gates, 4/10/96 "The Internet PC," Pl. Ex. 336, at MS7 007443; Benjamin Slivka 9/3/98 Dep. Tr. at 252-53; James Allchin 3/19/98 Dep. Tr. at 116)

²⁵ 4/10/96 "The Internet PC," Pl. Ex. 336, at MS7 007443.

server products, their commerce-server products, their collaboration products that are client and server.

And so in the same way that the Macintosh sort of faded away to irrelevance, in most people's opinion, because developers focused less and less on writing Macintosh applications, developers would focus less and less on writing Windows applications. And they would focus on Netscape applications. . . .

And so the—if all the developers were focused on building Netscape applications as opposed to Windows applications, then eventually, you know, Netscape decides, hey, we're going to get in the operating system business. And so they build an operating system, and now that's installed. That can get preinstalled on computers so they can sell it at retail, however they decide to distribute that.²⁶

4. MICROSOFT PLANNED TO EXTINGUISH THE BROWSER THREAT BY EXTENDING ITS CONTROL TO THE BROWSER MARKET Microsoft responded to the Netscape threat by adopting a strategy aimed at extending its dominance over PC operating systems to Internet browsers. Microsoft recognized that it could protect its dominant position in the PC operating systems market by gaining and keeping a large share of the business in Internet browsers and by preventing any other browser from having a sufficient share to either threaten Microsoft's platform dominance or to remain viable as a platform.²⁷ Moreover, if Microsoft's Internet Explorer (IE) browser were the dominant browser and Microsoft decided to support only Windows-based technology, developers would have little incentive to create applications that were not Windows-based.²⁸

Microsoft took a number of anticompetitive actions to exclude competition in Internet browsers. These were acts that Microsoft would not have undertaken except to exclude and foreclose competition and protect the applications barrier to entry.

²⁶ Benjamin Slivka 9/3/98 Dep. Tr. at 252-53.

²⁷ 6/20/96 re "windows & internet issues," Paul Maritz to Brad Silverberg et al.: Pl. Ex. 42, at MS6 6010346-47; 4/21/97 Brad Chase to Jeff Raikes et al.: Pl. Ex. 59, at MS7 004365.

²⁸ 5/26/95 Bill Gates to Executive Staff and direct reports re "The Internet Tidal Wave": Pl. Ex. 20, at MS98 0112876.3.

C. Microsoft's attempts to allocate markets

1. MICROSOFT'S JUNE 1995 ATTEMPT TO DIVIDE MARKETS WITH NETSCAPE Microsoft's activities to prevent the emergence of the browser as a platform threat were part of a course of conduct that was undertaken to prevent other firms from developing platform software that might threaten the Windows operating system monopoly.

One of the first actions Microsoft took to stem the incipient threat to its monopoly posed by browsers was, in 1995, to solicit its emerging competitor, Netscape, to engage in a market allocation scheme. Microsoft's attempt to enter into a horizontal agreement with Netscape to eliminate Netscape as a competitor supplying browsers for Windows 95 is significant because, if Netscape had agreed, Microsoft would have succeeded in eliminating its only serious browser competitor. Since Windows was the most popular operating system by far, an agreement by Netscape not to produce a browser for Windows would have eliminated Navigator as a threat to the applications barrier to entry.²⁹

The attempt to divide markets was also significant because it helped to reveal the purpose and effect of actions taken by Microsoft when Netscape refused to agree to divide markets.

²⁹ According to the court, "Microsoft's first response to the threat posed by Navigator was an effort to persuade Netscape to structure its business such that the company would not distribute platform-level browsing software for Windows. Netscape's assent would have ensured that, for the foreseeable future, Microsoft would produce the only platform-level browsing software distributed to run on Windows. This would have eliminated the prospect that non-Microsoft browsing software could weaken the applications barrier to entry." (¶ 78)

See the testimony of the participants in the June 1995 meetings and contemporaneous documents (e.g., Barksdale Tr. at 236; Marc Andreessen 7/15/98 Dep. Tr. at 463-72). For evidence that Microsoft made an effort to induce Netscape to agree to draw a line between Windows 95 browsers and other browser-related products, see 6/21/95 Marc Andreessen "to jimb et al.:" Pl. Ex. 547, at NET 000914; Pl. Ex. 33, at NSC017098; 6/1/95 re "working with Netscape," Thomas Reardon to Ben Slivka, Paul Maritz, et al.: Pl. Ex. 24, at MS98 0009597.

We have read Gates' deposition testimony in which he denied any participation in preparing for the June 1995 meetings with Netscape and in which he testified that he first heard of a June 1995 attempt to divide markets when a story appeared in the *Wall Street Journal*.³⁰ However, the testimony of participants in the June 1995 meetings and other contemporaneous documents make quite clear that an attempt to divide markets between Microsoft and Netscape was made in June 1995.

For example, Barksdale (who participated in the June 21, 1995, meeting with Microsoft) and Netscape chief technology officer Marc Andreessen (who also participated in the June 21 meeting) both testified that Microsoft tried to convince Netscape to divide the browser market by drawing a line between browsers for Windows 95 and all other platforms, including Windows 3.1, with Netscape and Microsoft agreeing that Netscape would stop marketing browsers for Windows 95.

2. SIMILAR CONDUCT BY MICROSOFT—INTEL AND APPLE Microsoft also engaged in similar conduct with Intel and with Apple. When Intel proposed offering certain platform-level software that conflicted with Microsoft's platform plans, Microsoft threatened, among other things, to withhold support for Intel's new generations of processors if Intel proceeded with its plans. In the words of Intel chairman Andy Grove, Intel ultimately "caved" and withdrew the effort, at least under its own brand, explaining, "Introducing a Windows-based software initiative that Microsoft doesn't support . . . well, life is too short for that."³¹

Microsoft's internal documents, including particularly confidential messages from Bill Gates personally, confirm Microsoft's attempt to convince Intel to agree not to engage in platform

³⁰ Bill Gates 8/27/98 Dep. Tr. at 265-66. Gates also testified he did not know until the *Wall Street Journal* story that a claim of attempted market division was included in the Complaints of the United States and the State Attorneys General. (Gates 8/27/98 Tr. at 271-72)

³¹ 7/8/96 Brent Schlender, *A Conversation with the Lords of Wintel*, FORTUNE: Pl. Ex. 559, at 8.

competition with Microsoft by developing its Native Signal Processing (NSP) technology, which would have endowed microprocessors with enhanced video and audio capabilities.³² Because the NSP technology would have been available for non-Windows platforms it could have presented a threat to Microsoft's monopoly power.³³

Steven McGeady of Intel explained that Microsoft also discouraged Intel from supporting Netscape or Java as an alternative platform.³⁴ Similarly, Microsoft documents confirm that Microsoft used its relationship with Intel to discourage Intel from supporting Java or Netscape's browser.³⁵ The documents show that Microsoft

³² 5/25/95 Gates to Grove: Pl. Ex. 277, at MS98 1069352. According to Gates: "The main problem between us right now is NSP [Native Signal Processor]. We are trying to convince them to basically not ship NSP." (7/7/95 re: "Our Dinner" Gates to Silverberg et al.: Pl. Ex. 278, at MS98 0169009); Gates also reported that: "Andy believes Intel is living up to its part of the NSP bargain and that we should let OEMs know that some of the new software work Intel is doing is Ok." (Plaintiff's Exhibit 381)

³³ According to Judge Jackson, ". . . the software threatened to offer ISVs and device manufacturers an alternative to waiting for Windows to provide system-level support for products that would take advantage of advances in hardware technology. More troubling was the fact that Intel was developing versions of its NSP software for non-Microsoft operating systems. The different versions of the NSP software exposed the same set of software interfaces to developers, so the more an application took advantage of interfaces exposed by NSP software, the easier it would be to port that application to non-Microsoft operating systems. In short, Intel's NSP software bore the potential to weaken the barrier protecting Microsoft's monopoly power." (¶97)

³⁴ Steven McGeady 8/10/98 Dep. Tr. at 11-12, 18-20, 34-37, 57-60, 64-67; "On August 2, 1995, in a meeting of Intel and Microsoft executives, Bill Gates told Intel CEO Andy Grove to shut down the Intel Architecture Labs. Gates didn't want IAL's 750 engineers interfering with his plans for domination of the PC industry." 8/28/95 Pl. Ex. 280, at INT 0386.

³⁵ 6/9/96 Gates to Maritz et al.: Pl. Ex. 289, at MS98 0169187.

engaged in extensive efforts to convince Intel not to support competing technologies, even when those competing technologies would enhance the performance of Windows PCs.³⁶

Microsoft also attempted to suppress platform-level competition from Apple. Timothy Schaaff described how Apple promoted QuickTime, its multimedia streaming technology, as an audio/visual content creation/authoring and playback mechanism on the Windows operating systems.³⁷ Microsoft, however, considered audio/visual streaming technologies to be part of a "growing collection of technologies" that "were a threat to the Windows platform." Beginning in 1997, Microsoft representatives informed Apple that "Microsoft wanted to have control over the user interface . . . and that Microsoft was determined that the essential APIs that were the foundation of the operating system should all come from Microsoft and not come from a third party."³⁸ Microsoft offered to forego competing in the multimedia authoring tools market if Apple would scale back its efforts to establish QuickTime as a multimedia platform on the Windows operating system. In addition to this inducement, Microsoft also set forth a threat: in the absence of an accommodation, Microsoft could devote 100 to 150 engineers to competing against Apple in the authoring tools market even though, as Microsoft's representative put it, this action made "no sense from a business standpoint."³⁹

As these incidents indicate, Microsoft was prepared to respond immediately to prevent the long-run threat of any other firm from

³⁶ For example, Microsoft's general manager for Internet multimedia, Eric Engstrom, wrote to his superiors that he was working "aggressively" to convince "Intel to stop helping Sun create Java Multimedia APIs, especially ones that run well (ie native implementations) on Windows." 5/26/97 Eric Engstrom to John Ludwig and David Cole et al.: Pl. Ex. 235, at MS7 027416.

³⁷ Timothy Schaaff 8/28/98 Dep. Tr. at 37-38.

³⁸ Schaaff 8/28/98 Dep. Tr. at 42.

³⁹ *Id.* at Tr. at 38-41, 60.

writing platform-level software.⁴⁰ This was true even though in the short run this software could increase the functionality and performance of, and thus the demand for, Windows-based PCs.

Microsoft's conduct with respect to Intel and Apple is consistent with its efforts to prevent browsers from becoming a threat to the applications barrier to entry.

- a. In each case, Microsoft was confronted with platform-level software to which applications programs could be written.
- b. In each case, platform-level APIs threatened to erode the applications barrier to entry into PC operating systems by supporting applications programs that could be used with multiple operating systems.
- c. In each case, Microsoft responded by attempting to get the supplier of the potential alternative platform-level software to agree to withdraw from offering it and to concentrate instead on products that did not offer platform potential.
- d. In each case, Microsoft was prepared to act to preclude the supplier of a potential platform-level software from succeeding in offering the platform, even if such actions did not "make sense from a business standpoint." That is the touchstone of an anticompetitive action.

3. MICROSOFT'S PREDATORY CAMPAIGN TO EXCLUDE BROWSER COMPETITION Microsoft's response to the prospect of a successful Netscape browser with cross-platform APIs that could erode the applications barrier to entry was to engage in predatory conduct. In May 1995, Microsoft CEO Bill Gates warned his top executives that the browser could "commoditize" the operating system, and, as we have seen, in June 1995, Microsoft attempted to forge an agreement with Netscape that Netscape would not offer a browser for Windows 95.

⁴⁰ With respect to QuickTime, Judge Jackson commented that "the primary motivation behind Microsoft's proposal to Apple was not the resolution of incompatibilities that frustrated consumers and stymied content development. Rather, Microsoft's motivation was its desire to limit as much as possible the development of multimedia content that would run cross-platform." (¶ 110)

Once Microsoft recognized the potential threat posed by Netscape's browser, Microsoft began devoting at least \$100 million per year to developing its own browser. Microsoft also spent tens of millions of dollars a year marketing and promoting IE.⁴¹

Despite the significant browser-related costs it was incurring, Microsoft distributed its browser at a negative price. The IE browser was not only given away free; companies were also paid money and given valuable concessions to accept, use, distribute, and promote IE.⁴² Microsoft's internal documents make clear that Microsoft undertook its browser development not to make money from browsers but to prevent Netscape's browser from facilitating competition with Microsoft's monopoly operating system.

One Microsoft document, while hardly unique, is especially revealing. Under the heading "Own Corporate browser licensing," Brad Chase of Microsoft wrote, "This is one of the biggest potential revenue opportunities for Netscape . . . we should have absolute dominant browser share in the corporate space . . . make it very clear it does not make sense for them to buy Netscape Navigator."⁴³

Indeed, Microsoft undertook detailed studies of Netscape's sources of revenue and what Netscape required to survive as an effective competitor. When it made its decision to supply IE without charge, Microsoft estimated that from 20% to 50% of Netscape's revenues came from licensing its browser.⁴⁴ Microsoft's decision to price its own browser below cost was thus made when it knew that Netscape was charging for its browser and that Net-

⁴¹ Schmalensee Direct ¶ 211; Mehdi Dep. Tr. 1/13/99, at 655:4-20 (IE FY97 marketing budget roughly \$30 million).

⁴² 7/24/96 re "Intuit call with Scott Cook," Bill Gates to Lewis Levin et al.: Pl. Ex. 94, at MS6 6007642.

⁴³ 4/4/96 re "FY97 Planning Memo: 'Winning the Internet platform battle'," Brad Chase to FY97 WWSMM Attendees: Pl. Ex. 39, at MS6 5005720.

⁴⁴ Bill Gates 8/27/98 Dep. Tr. at 236.

scape depended on those revenues to continue to compete effectively. Indeed, Microsoft candidly described its pricing of its browser to Intel in an effort to convince Intel not to do business with Netscape, saying that Microsoft was “going to be distributing the browser for free” and that “this strategy would cut off Netscape’s air supply, keep them from gaining any revenue to reinvest in their business.”⁴⁵

Without the gain to Microsoft that would result from preserving its highly profitable operating system monopoly and from monopolizing the browser market, Microsoft’s conduct does not make good business sense. It was giving away something that it had spent a lot of money to develop and distribute and something for which the leading competitor was charging. It is only when Microsoft’s gains from preserving and extending its monopoly are included that Microsoft’s conduct appears to be profitable.

At trial, Microsoft argued that its conduct was profitable without considering gains from reducing competition because the wide distribution of its browser causes more people to buy PCs to browse the Internet, with the result that Microsoft sells more copies of its Windows operating system. This argument is incorrect, in part for the following reasons:

- a. Microsoft’s internal documents do not support the suggestion that either the purpose or effect of Microsoft’s predatory pricing of browsers was to increase sales of Windows.
- b. As an analytical matter, browsers can be complements to operating systems to the extent that the sale of browsers that can be used with Windows will increase demand for Windows. However, whatever Microsoft’s interest in developing its own browser, it should have no interest in taking from users (and their proxies, OEMs), in whole or in part, the option to choose the complements that maximize the value of the operating system to them. But Microsoft cared greatly who made the browsers used with Windows.
- c. Indeed, Microsoft tried to discourage Netscape from offering its browser for use with Windows—an action inconsistent with Microsoft’s argument as to complements.

⁴⁵ Steven McGeady 8/10/98 Dep. Tr. at 16–17.

- d. Microsoft devoted substantial time, effort, and money to developing and distributing a version of IE for Apple computers. Microsoft gets no money from increasing sales of Apple’s operating system; indeed, since Apple offers the main alternative to a PC using Windows, promoting complements to Apple that increase Apple’s attractiveness to users *reduces* sales of Windows.⁴⁶
- e. Microsoft was preoccupied not with increasing total sales of browsers, but with Microsoft’s *share* of browser sales. Indeed, Microsoft studied, and tried to implement, ways to disable Netscape and reduce total browser sales. This conduct doesn’t make business sense if browsers are viewed as a means of increasing sales of Windows. But this conduct is sensible if browsers are viewed as a competitive threat to Microsoft’s Windows monopoly.

Microsoft also argued that it undertook its actions in order to earn ancillary revenues from IE, largely from gaining a portal Internet site and accompanying ancillary revenues. This argument is incorrect:

- a. There is no evidence that Microsoft *ever* considered such revenues until after the trial had begun. Indeed, Microsoft referred to IE as a “no-revenue product” while emphasizing its importance to Microsoft’s position.⁴⁷
- b. Microsoft concluded that Netscape could not be profitable simply from such portal revenues while being forced to give away its browser,
- c. As described below, Microsoft took actions that it knew would “put a bullet in the head” of its own Internet service, MSN, in order to encourage America Online (AOL) to adopt IE.⁴⁸
- d. Microsoft contracts with ISPs penalized them for excessive distribution of Netscape even if they also distributed IE.

⁴⁶ In its defense, Microsoft argued that it needed to offer IE to Apple so that enterprises that had an installed Mac base and wanted to standardize on a single browser would find Windows 98 an attractive option for those users who were not part of the Mac base or who were willing to switch operating systems.

⁴⁷ Government Exhibit 39.

⁴⁸ Silverberg Dep. Tr. 1/13/99, at 703:13–705:11.

- e. Most revealing of all, Microsoft permitted OEMs to put their own "shells" on a browser and thus direct users to their own portal sites *provided that the browser was IE*. This suggests that Microsoft was concerned only about the technology—the APIs that the browser would expose to software developers and not about the portal revenues.

We note that *Microsoft* does not relate to a situation where a product is sold at a price that arguably covers some definition of cost; in the present case, Microsoft distributed its browser at a zero (indeed, a negative)⁴⁹ price. Furthermore, *Microsoft* is not a situation where there is doubt as to the purpose of a company's pricing; in the present case, Microsoft made clear that the purpose of its decision to distribute its browser for free was to "cut off Netscape's air supply." Moreover, this case is not a situation where there is doubt as to a company's ability to recoup foregone profits through the preservation or obtaining of monopoly power. The preservation of Microsoft's operating system monopoly alone would permit recoupment. Finally, *Microsoft* is not a case where a company sets a price below cost with the reasonable expectation that such pricing will result in competitive revenues from other products or services; Microsoft's contemporaneous documents show no sign that the company's zero (or negative) price for its browser was considered a way to earn competitive ancillary revenues. Rather, it was considered a way to prevent potential competition from alternative platforms.⁵⁰

⁴⁹ The price was negative because Microsoft gave up valuable concessions such as space on the desktop (and the opportunity to earn money therefrom) in exchange for commitments to distribute its browser; see Pl. Ex. 1115 (ISP referral fees).

⁵⁰ According to the court, "had Microsoft not viewed browser usage share as the key to preserving the applications barrier to entry, the company would not have taken its efforts beyond developing a competitive browser product, including it with Windows at no additional cost to consumers, and promoting it with advertising. . . . [T]he considerable additional costs associated with enlisting other firms in its campaign to increase Internet Explorer's usage share at Navigator's expense . . . was

Microsoft's predatory pricing was part of, and should be evaluated in connection with, its broader campaign to eliminate Netscape's Navigator and Sun's Java as sources of potential danger to the applications barrier to entry protecting Microsoft's operating system monopoly. This was a campaign characterized by actions in which Microsoft lost money in order to raise rivals' costs and exclude them from the market;⁵¹ by actions that Microsoft recognized internally did not "make sense from a business standpoint," except for their anticompetitive effects; and by Microsoft's agreements with customers and competitors that required them to refuse to deal with Netscape—or to do so only on unfavorable terms.

For example, as described below, Microsoft sought to further deprive Netscape of revenue by inducing internet content providers (ICPs) to agree *not to pay* Netscape for carrying or promoting the ICPs' content or logos. Moreover, Microsoft was prepared to give away valuable concessions to ICPs to secure such agreements. Microsoft could have had no procompetitive justification for such a restriction. Even though direct agreements with ICPs proved in the end not to be important, the fact that Microsoft was directly interested in preventing Netscape from receiving revenue is highly revealing.

Microsoft also entered into agreements with companies such as Intuit, a leading software applications supplier that competes with Microsoft in the supply of applications software, in which the companies agreed to "Bundle IE3 (Quicken) and IE4 (other products) with all new 97 and 98 releases of Intuit products," and to "[N]ot enter into marketing/promo agreements with Other

only profitable to the extent that it protected the applications barrier to entry. . . . Microsoft's costly efforts to limit the use of Navigator on Windows could not have stemmed from a desire to bolster consumer demand for Windows. . . ." (¶141)

⁵¹ Steven C. Salop & David T. Scheffman, *Cost-Raising Strategies*, 36 J. INDUS. ECON. 19 (1987).

Browser manufacturers for distribution or promotion of Intuit content."⁵²

Microsoft's dealings with Apple are evidence of how far Microsoft was willing to go to limit Netscape's opportunities and to stifle Java. One of Bill Gates' explicit "key goals" was to get Apple "to embrace Internet explorer in some way."⁵³ In June 1996, Gates proposed a "deal" to "top Apple executives" in which the first element of what "Microsoft gets" was "Apple endorses Microsoft Internet explorer technology."⁵⁴ Microsoft's determination to get Apple to agree to work "against Sun and Netscape" and its willingness to engage in conduct that didn't "make sense from a business standpoint" to accomplish that purpose are illustrated by numerous Microsoft documents.⁵⁵

Microsoft's determination to restrict the support and distribution of Netscape's browser by Apple is particularly significant when one considers that Apple represents the main potential alternative to desktop PCs running Microsoft's Windows. Whatever the relevance of Microsoft's arguments about why it wanted to make IE available to sell more copies of Windows, those arguments cannot apply to Microsoft's efforts to force Apple to distribute IE. In addition, there is no legitimate justification for Microsoft and Apple (two competitors) entering into an agreement "to undermine SUN."⁵⁶

⁵² 4/17/97 "Intuit Terms Agreed," Will Poole to Brad Chase: Pl. Ex. 206.

⁵³ 6/23/96 "Apple meeting," Bill Gates to Paul Maritz et al.: Pl. Ex. 260, at MS98 0113116.

⁵⁴ 6/23/96 "Apple meeting," Bill Gates to Paul Maritz et al.: Pl. Ex. 260.

⁵⁵ *E.g.*, 2/26/97 "Moving forward with Mac Office 97," B. Waldman to Bill Gates: Pl. Ex. 263, at MS98 0113394; 8/8/97 re "post-agreement," A. Tevanian to Bill Gates: Pl. Ex. 265; 8/8/97 re "post-agreement," Bill Gates to Paul Maritz et al.: Pl. Ex. 265; 1/22/98 re "Steve Jobs Call," Bill Gates to Paul Maritz et al.: Pl. Ex. 267, at MS98 0104472.

⁵⁶ 8/8/97 re: "post-agreement," Bill Gates to Paul Maritz et al.: Pl. Ex. 265.

Although it is obvious, it is worth emphasizing that the Microsoft documents that reveal Microsoft's predation are not documents from low-level employees or employees likely to be misinformed about the purpose and effect of the company's conduct. Many of the most significant documents are documents to or from CEO Bill Gates, personally.

D. Microsoft's bundling of its browser with its monopoly operating system and its restrictions on OEMs

1. MICROSOFT'S DECISION TO BUNDLE IE WITH WINDOWS Although IE was not originally "tied" or "bundled" with the retail version of Windows 95 when it was first released in the summer of 1995, Microsoft did bundle IE with Windows 95 in distributing Windows 95 to OEMs, and IE is now bundled with all Windows 95 and Windows 98 operating systems that Microsoft distributes through retail or OEM channels.⁵⁷ (In Windows 98 the browser has been designed so as to share extensive code with the operating system.) Microsoft made the decision to bundle IE and Windows in one form or another even though there is demand for browsers separate from the demand for operating systems.⁵⁸

Microsoft made its bundling decision not to achieve efficiencies but to foreclose competition.⁵⁹ The problem is not that Microsoft offered OEMs and users a bundled version of Windows

⁵⁷ In the traditional terminology of economics, bundling relates to situations in which firms sell packages of two or more products. Tying, often used interchangeably with bundling is applied by many economists to cases in which the consumer must purchase one product in order to obtain another. With this terminology, it is appropriate in our view to describe the browser as having been bundled with and tied to the operating system.

⁵⁸ According to the court, "Many consumers desire to separate their choice of a Web browser from their choice of an operating system." (¶ 151) "Moreover, many consumers who need an operating system, including a substantial percentage of corporate consumers, do not want a browser at all." (¶ 152)

⁵⁹ 1/2/97 "IE and Windows," J. Allchin to Paul Maritz: Pl. Ex. 48; 2/24/97 C. Wildfeuer to Adam Taylor et al.: Pl. Ex. 202, at MS7 004346.

and IE; it is that Microsoft did not give them the option of taking Windows without the browser. It thus compelled those OEMs and users that wished otherwise to take IE in order to get Windows. This foreclosure of competition had an immediate harmful effect on consumers, whose choice of browsers was restricted and who faced substantial uncertainty.⁶⁰ The harm was not simply to consumers who faced limited browser choice; other harms resulted from the unnecessarily cumbersome operating system, and by the limited options of those who preferred not to use a browser.⁶¹

⁶⁰ According to the court, "when a user chooses a browser other than Internet Explorer as the default, Windows 98 nevertheless requires the user to employ Internet Explorer in numerous situations that, from the user's perspective, are entirely unexpected. As a consequence, users who choose a browser other than Internet Explorer as their default face considerable uncertainty and confusion in the ordinary course of using Windows 98." (¶ 171) Further, "The decision to override the user's selection of non-Microsoft software as the default browser also directly disinclined Windows 98 consumers to use Navigator as their default browser, and it harmed those Windows 98 consumers who nevertheless used Navigator. In particular, Microsoft exposed those using Navigator on Windows 98 to security and privacy risks that are specific to Internet Explorer and to ActiveX controls." (¶ 172)

⁶¹ According to Judge Jackson, "Microsoft's actions have inflicted collateral harm on consumers who have no interest in using a Web browser at all. If these consumers want the non-browsing features available only in Windows 98, they must content themselves with an operating system that runs more slowly than if Microsoft had not interspersed browsing-specific routines throughout various files containing routines relied upon by the operating system. More generally, Microsoft has forced Windows 98 users uninterested in browsing to carry software that, while providing them with no benefits, brings with it . . . costs [that] . . . include performance degradation, increased risk of incompatibilities, and the introduction of bugs. Corporate consumers . . . who do not want Web browsing at all, are further burdened in that they are denied a simple and effective means of preventing employees from attempting to browse the Web." (¶ 173) Also, "Microsoft has harmed even those consumers who desire to use Internet Explorer, and no other browser, with Windows 98. To the extent that browsing-specific routines have been commingled with operating system routines to a greater degree than is necessary to provide any consumer benefit, Microsoft has unjustifiably . . . increased the likelihood that a browser crash will cause the entire

Microsoft also recognized that OEMs wanted the ability to develop their own screens and substitute Netscape's browser for IE. As a result, in 1996, Microsoft imposed screen and start-up restrictions to prevent OEMs from developing their own first screen or positioning competing browsers more favorably than IE. Presumably, the OEMs wished to do these things as a way of attracting and serving their customers. Indeed, OEMs can be expected to make a profit-maximizing choice of browser to sell with an operating system products. To the extent that Microsoft cared that the browsers used with its Windows products were high quality, it could rest assured that the OEMs' incentives were aligned with its own. (In this connection, it is interesting that Microsoft sometimes relaxed its start-up restrictions on OEMs but *never* did so if the relaxation involved promoting a non-IE-based browser.)

2. MICROSOFT'S RESTRICTIVE AGREEMENTS WITH PC MANUFACTURERS In connection with its tying of IE and Windows, Microsoft required the distribution of IE and restricted the distribution of other browsers by entering into restrictive agreements with PC original equipment manufacturers. The agreements required OEMs who wanted to preinstall Windows 95 or Windows 98 on their machines (meaning all PC manufacturers) also to preinstall Microsoft's IE. The agreements also limited the ability of OEMs to promote other browsers, or to substitute other browsers for IE. Indeed, until changes were prompted by an early 1998 stipulation between Microsoft and the Department of Justice, the agreements typically required that licensees not modify or delete any of the product software. This prevented OEMs from removing any part of IE from the operating system, including the visible means of user access to the IE software, such as the IE icon on the Windows desktop or the IE entry in the "Start" menu.

Licensees were not contractually restricted from loading other browsers on the desktop. However, most OEMs preferred to load only one browser to avoid user confusion and the resulting con-

system to crash and made it easier for malicious viruses that penetrate the system via Internet Explorer to infect non-browsing parts of the system." (¶ 174)

sumer support costs, and to avoid increased testing costs.⁶² In addition, some OEMs viewed the desktop and/or disk space as scarce real estate and were generally reluctant to preinstall more than one software title in each functional category.⁶³

Microsoft's restrictions on the start-up screen were somewhat modified just before trial, so that OEMs had somewhat more flexibility than when the restrictions were imposed. However, IE was still required to be installed on every PC and the IE icon could not be removed. The result was a significant exclusionary effect that ensured that IE is the *only* browser on most PCs shipped by OEMs.⁶⁴ By January 1999, Navigator was on the desktop of only a very small percentage of the PCs being shipped.⁶⁵

⁶² Richard T. Brownrigg 3/5/98 Dep. Tr. at 34; Mal Ransom 3/19/98 Dep. Tr. at 28; Webb McKinney 3/13/98 Dep. Tr. pp. 29–30.

⁶³ Stephen Decker 10/17/97 Dep. Tr. at 22.

⁶⁴ In Judge Jackson's opinion, "In sum, Microsoft successfully secured for Internet Explorer—and foreclosed to Navigator—one of the two distribution channels that leads most efficiently to the usage of browsing software. Microsoft achieved this feat by using a complementary set of tactics. First, it forced OEMs to take Internet Explorer with Windows and forbade them to remove or obscure it. . . . Second, Microsoft imposed additional technical restrictions to increase the cost of promoting Navigator even more. Third, Microsoft offered OEMs valuable consideration in exchange for commitments to promote Internet Explorer exclusively. Finally, Microsoft threatened to penalize individual OEMs that insisted on pre-installing and promoting Navigator. Although Microsoft's campaign to capture the OEM channel succeeded, it required a massive and multifarious investment by Microsoft; it also stifled innovation by OEMs that might have made Windows PC systems easier to use and more attractive to consumers. That Microsoft was willing to pay this price demonstrates that its decision-makers believed that maximizing Internet Explorer's usage share at Navigator's expense was worth almost any cost." (¶ 241)

⁶⁵ In early January 1999, Compaq announced the installation of Navigator on the desktop of some of its machines. Significantly, Netscape had to pay Compaq several hundred thousand dollars for this. Microsoft had successfully raised the costs of its rival.

Microsoft also entered into a restrictive agreement with Apple that required Apple to make IE the default browser on all of its Macintosh operating systems. This agreement forced Apple to place all competing browsers in a folder (i.e., to remove other browsers from the Macintosh desktop) and limited Apple's ability to promote other browsers.⁶⁶ In order to induce Apple to enter this contract, Microsoft, among other things, threatened to stop development of its Office application suite for the Macintosh. As Microsoft knew, withdrawal of support for this crucial application would have had a devastating effect on the viability of the Macintosh operating system.⁶⁷ Since Microsoft derives revenue from licensing that application to Macintosh users (and none from IE), carrying out the threat (or even making it) could not have been profit-maximizing except for the effects on the browser wars and the applications barrier to entry.

As Avadis Tevanian, senior vice president of software engineering at Apple indicated, whatever the merits of IE as a browser there were "certainly no dependencies or it wasn't necessary to have IE be the default."⁶⁸ This suggests strongly that Microsoft's actions were not merely technology- or efficiency-driven.

3. MICROSOFT'S JUSTIFICATIONS FOR ITS BUNDLING AND RESTRICTION OF OEMS Microsoft proffered a number of justifications for its conduct, but none suggests that Microsoft's primary motive was anything other than to restrict competition in browsers.

Microsoft designed interdependencies between IE and Windows 98, and claimed that this was the rationale for its bundling practices. But even if two products as designed cannot readily be separated, the bundling or tying of the two can raise the same

⁶⁶ 8/5/97 "Technology Agreement between Apple Computer, Inc., and Microsoft Corporation": Pl. Ex. 1167, at MAC 0044–45.

⁶⁷ Avadis Tevanian 7/17/98 Dep. Tr. at 135–42. Judge Jackson concluded that, "By extracting from Apple terms that significantly diminished the usage of Navigator on the Mac OS, Microsoft severely sabotaged Navigator's potential to weaken the applications barrier to entry." (¶ 356)

⁶⁸ *Id.* at 142–43, 149.

anticompetitive concerns that contractual bundling or tying would raise. Moreover, such concerns are not automatically overcome merely because the bundle brings some amount of benefit to certain consumers.

Virtually every product design, particularly in the area of computer software, can make a plausible claim for some efficiency or benefit. Many software products can be combined in such a way that they share certain code; if code is shared there is some plausible efficiency (although perhaps very slight), and separating the two products once they have been combined may be very difficult. If combining two products in a way that produces plausible efficiencies (however slight), or that makes it difficult to separate the products, were an absolute defense to a claim that the combination was anticompetitive, software commerce would be essentially immune from tying scrutiny. In the present case, the evidence clearly shows that the anticompetitive effects are large, whereas the technological benefits appear to be small or nonexistent.

- a. Microsoft's chief technology officer James Allchin testified that the same consumer experience given by Windows 98 where the browser is welded into the operating system was provided by Windows 95 and IE 4. (Recall that IE is effectively added on top of a browserless operating system.) There are no benefits obtainable by putting separate IE and operating system code together that cannot be obtained otherwise.⁶⁹ When asked at trial whether Windows 98 was "just a distribution vehicle" for the technologies that Microsoft also distributed as Windows 95 and Internet Explorer 4, Allchin answered: "It's the same code out of Windows." Then, when asked whether "It's the same code, and all we're talking about are different distribution vehicles, in your words; correct, sir?", Allchin answered, "Yes, that's what I said, yes."⁷⁰
- b. Edward W. Felten, assistant professor of computer science at Princeton University, testifying for the government, pointed out

⁶⁹ Allchin agreed "that you can get those benefits [the browsing experience] either by buying Windows 98 or by having purchased an original retail version of Windows 95 to which you added IE 4 either downloaded or bought from retail or gotten in some other way." Allchin Testimony, 2/1/99, P.M., at 45:9-25.

⁷⁰ *Id.*

that Windows 95 need not have been so designed. This supports the view that there are not any benefits that can be obtained only by boxing IE and Windows code together, that one cannot get otherwise.⁷¹

- c. Microsoft's pressure on Apple to use IE could not have been driven by any such technological explanation.

In the context of an earlier proceeding involving a Microsoft consent decree, the Court of Appeals for the District of Columbia Circuit suggested in dicta that an innovation bringing any consumer benefit, no matter how small, would prevent analysis of anticompetitive effects, no matter how large. We are concerned that if such a doctrine were to be extended to antitrust law generally, it would provide an open invitation for firms to cloak exclusionary acts in minor innovations. Microsoft's argument that there was now no distinction between the operating system and the browser brings this issue to the forefront.

Microsoft argued that it must force OEMs to take IE because the absence of IE may undermine the quality of the operating system, to the detriment of users. However, several facts contradict this suggestion. For example, Microsoft provided ways to remove IE in Windows 95—a function that would most likely not have been provided if it led to a decrease in the quality of the operating system. Also, we have seen compelling evidence that it is possible within Windows 98 to remove the ability to browse the Web with IE and to replace IE with another browser with no appreciable decline in the quality of the Windows 98 operating system.⁷²

⁷¹ E.g., Felton 1/14/98A.M., at 60:18-61:2.

⁷² As Professor Felten explained, "It is possible to construct a mechanism for removing Web browsing from Windows 98. . . . This demonstrates that Microsoft could have produced a version of Windows 98 without Web browsing in a way that did not endanger the functionality of the operating system." (Edward W. Felten 9/1/98 Expert Report at 13-14.) Importantly, the Court found that "No consumer benefit can be ascribed, however, to Microsoft's refusal to offer a version of Windows 95 or Windows 98 without Internet Explorer, or to Microsoft's refusal to provide a method for uninstalling Internet Explorer from Windows 98." (¶ 186)

In fact, Microsoft permitted Dell to remove IE from the desktop for Windows 95 at the request of that OEM's large customers. Presumably, Microsoft would not allow this kind of exception if it undermined the quality of the operating system. Likewise, OEMs would not negotiate to remove IE if the operating system would be adversely affected, since a poorly operating computer would reflect poorly on the OEM and would be likely to increase the number of customer support calls; also, large customers would not request an operating system with IE removed if they felt this system would be adversely affected.

As noted above, just before trial, Microsoft began to allow OEMs slightly more flexibility on the first screen and the ISP registration process. It seems unlikely that either Microsoft or the OEMs believed that these changes would lead to significant deterioration in the quality of the operating system.

Microsoft also argued that its bundling of IE is necessary to provide a uniform platform for software developers. We note, however, in light of the different versions of Windows and IE that Microsoft has put in the marketplace, developers that rely on system services or code found in IE must redistribute the necessary IE code anyway to ensure that the proper version of the necessary DLL (dynamic link library) or file is present to support their applications.⁷³

Microsoft argued that it is justified in restricting OEMs from altering the start-up process to preserve the quality and speed of the start-up process and to give each user a consistent experience. However, the fact that Microsoft has granted exceptions to these restrictions to certain OEMs suggests that the concern for quality, speed, and consistency is not Microsoft's primary motive for enforcing these restrictions.

If Microsoft did not have monopoly power, it would not have an incentive to engage in anticompetitive (i.e., otherwise unprofitable) bundling because (1) it would not have the market power to force unwanted code on users, and (2) except in the case where

a substantial increase in market power was a likely result, it would not have monopoly returns sufficient to justify an otherwise unprofitable bundling strategy. Absent monopoly power (or, at least, significant market power), we believe that bundling is likely to be harmless and to serve legitimate business purposes, because bundling is not a rational anticompetitive strategy for a firm that lacks significant market power. We conclude that, in the case of Microsoft, the types of provisions at issue were anticompetitive. They inhibited PC manufacturers from pre-installing and promoting competing browsers. Their purpose and effect was to weaken browser competition in order to protect Microsoft's business in operating systems. The benefit gained by creating interdependencies between IE and Windows would have to be great to counterbalance the anticompetitive effects of bundling.

E. Exclusionary agreements with Internet service providers

Microsoft also required the promotion and distribution of IE, and restricted the promotion and distribution of other browsers, by striking deals with ISPs in order to protect Microsoft's business in operating systems. ISPs, including the online service providers (OLSs) are, after OEMs, the largest distributors of browsers.

Because of the monopoly position of Microsoft's Windows operating system, ISPs are very interested in having favorable placement on the Windows desktop in order to attract subscribers. Microsoft understood this and, as part of its effort to exploit its Windows advantage, designed a special access method called the Internet Connection Wizard to assist users in signing up for ISPs. Only a few ISPs could be accessed through the Internet Connection Wizard. Initially there were 12, including some of the largest ISPs.

By mid-August of 1996, Microsoft had signed "IE Preferred" distribution agreements with about 2500 ISPs, including most of the largest in the United States. These agreements usually specified that IE would be the preferred and default browser. While the ISPs could distribute other browsers, Microsoft's contracts with

⁷³ Carl Bass 11/21/97 Decl. ¶4-6; John Gailey 11/17/97 Decl. ¶4.

ISPs who received a preferred placement on the desktop typically required that the ISPs not distribute other browsers to more than a relatively small fraction of their customers.

Some ISPs had agreements that allowed them to distribute IE and Netscape without preferences; Microsoft's documents use the term "IE Parity" to identify these companies.

Microsoft also created another desktop folder for ISPs which were OLSs and entered into agreements with AOL, CompuServe, Prodigy, and AT&T to appear in it.

Brad Silverberg, formerly senior vice president of applications and internet client group at Microsoft, described the advantages of Microsoft's mechanisms for signing up Internet and online services subscribers, such as the Internet Connection Wizard and online services folder. In the context of questioning about Microsoft's negotiations with AT&T, Silverberg testified that: "We made it very easy for AT&T to acquire customers and sign up and have them configured. And you wouldn't have to have a CD mailed to you."⁷⁴

Microsoft used the strong demand by OLSs for access to Microsoft's Windows operating system to extract promises from the services not to deal with Netscape or to do so only on very unfavorable terms.⁷⁵ In particular, Microsoft reached an agreement with AOL, which by early 1996 was being installed on a large number of PCs, to ship IE.

While Microsoft charged a referral fee for customers that the ISPs acquired through the Windows 95 desktop, browser share, not revenue, was the object of the agreements. Microsoft also made valuable concessions, directly or indirectly, to the ISPs. These varied across ISPs but included joint marketing programs, pricing deals, and discounts from referral fees for users switched from competing browsers.

⁷⁴ Brad Silverberg 4/14/98 Dep. Tr. at 176.

⁷⁵ *Id.* at 159.

In particular, Microsoft offered AOL a substantial discount in referral fees if it would ship IE. Microsoft explicitly recognized that the decision to grant OLSs favorable access to Windows (particularly AOL) was an expensive one. However, Bill Gates decided that the lost opportunity was less important than its overriding goal of winning "the browser battle" and protecting its core monopoly. For example, in a conversation about MSN in the spring of 1996 (just after Microsoft's March 12, 1996, agreement granting AOL favorable access to Windows), Bill Gates is quoted as saying:⁷⁶

We have had three options for how to use the "Windows Box": First, we can use it for the browser battle, recognizing that our core assets are at risk. Second, we could monetize the box, and sell the real estate to the highest bidder. Or third, we could use the box to sell and promote internally content assets. I recognize that, by choosing to do the first, we have leveled the playing field and reduced our opportunities for competitive advantage with MSN.

In return, Microsoft extracted strong restrictions on use of Netscape by the ISPs. These were not, as Microsoft claimed at trial, merely joint marketing agreements. For one thing, the product being "jointly marketed"—IE—was in Microsoft's own words "a no-revenue product."⁷⁷ For another, the ISPs had to accept restrictions on their shipment of other browsers *not just to subscribers acquired through placement in Windows, but to all subscribers, however acquired.*

There is little doubt that AOL's performance under the restrictive agreement with Microsoft had strong positive effects on Microsoft's browser share. Importantly, restrictions on AOL and the other OLSs were not waived by Microsoft in 1998 when, on the eve of the litigation, restrictions were modified for many other ISPs.

⁷⁶ MICHAEL A. CUSUMANO & DAVID B. YOFFIE, *COMPETING ON INTERNET TIME: LESSONS FROM NETSCAPE AND ITS BATTLE WITH MICROSOFT* 112 (1998); Brad Silverberg 4/14/98 Dep. Tr. at 187.

⁷⁷ Government Exhibit 39.

As this article is being written, AOL has continued to ship IE despite its late 1998 acquisition of Netscape, renewing its arrangement with Microsoft through 2001 and affirming its intention to continue. This is what economic analysis leads us to expect. If, without the merger, the benefits to AOL of using IE exceeded the sum of the benefits to AOL from using Netscape and the benefits to Netscape of being used by AOL, then, unless the merger increased the latter sum, the decision by the merged entity should remain the same. Moreover, while a decision to switch to Navigator by AOL might threaten the applications barrier to entry, such a threat is not necessarily more plausible after the merger than before (particularly since the browser danger to the barrier has been averted by Microsoft's actions). Even were this not the case, the value to AOL of facilitating a challenge to Microsoft's monopoly power in operating systems must be far less than the value to Microsoft of preventing that challenge. Hence, at most, the AOL acquisition of Netscape may increase the rents that Microsoft has to pay to AOL to preserve the barrier. It will not affect the barrier itself.

While there was some variation in the restrictions imposed on the OLSs and other ISPs, in general these agreements with Microsoft limited the ISPs' ability to promote and distribute third-party browsers. The agreements usually stated that Microsoft would provide users with access to ISP services from the desktop, and in return, ISPs were not only required to promote IE, but they were also required not to promote other browsers. Typically, such restrictive provisions involved percentage restrictions on shipping for larger ISPs and restrictions on promotional efforts for smaller ISPs. These limitations included

- a. Requirements that 75% or more of the ISP software shipments include IE as the only browser and that the ISP not ship a competing browser unless a customer specifically requested it;
- b. Limitations on ISP links to use or download third-party browsers on the ISP home Web page or any other Internet access service Web page offered by the ISP;

- c. Limitations that restricted the *total* shipments of non-Microsoft browsers by independent software vendors.⁷⁸ These limitations applied to shipments to *all* subscribers, not just to those obtained through favorable placement in the Windows desktop; and
- d. Prohibitions on expressing or implying that an alternative browser is available, including limitations on displaying any logo for a non-IE Web browser on the ISP home Web page or any other Internet access service Web page offered by the ISP.

By early 1998, Microsoft had become aware that it was on the verge of being sued by the Department of Justice. It is not surprising therefore that, in April 1998, Microsoft issued a statement to certain ISPs with which it had restrictive agreements, waiving some of the restrictions in their agreements. For example, in a letter to Earthlink, Microsoft committed not to enforce provisions concerning distribution volumes or percentages; discussion, promotion, or advertising of IE; and the use of IE as a standard or default browser. In addition, restrictions, performance obligations, and qualifications for referral fees were removed.⁷⁹

However, ISPs in the Internet Connection Wizard were (and are) still prohibited from distributing and promoting Navigator with "preference." IE must be discussed, promoted, or advertised so that in its entirety, its treatment is no less prominent and favorable than that accorded to Navigator. Even as regards other ISPs, Microsoft remains free to reimpose even the waived restrictions, and whatever the extent of Microsoft's waiver, it did not undo the harm to competition that had already occurred.

In its agreements, Microsoft offered ISPs valuable space on its desktop as well as direct payments in the form of rebates or bounties. In exchange, Microsoft placed requirements on ISPs that hindered their ability to promote or distribute Netscape Navigator.

⁷⁸ Even when a customer specifically requested another browser, the ISP could not provide another browser if doing so would cause the total shipments of its non-Microsoft browsers to exceed a specified percentage, typically 25% of all browsers shipped by that ISP.

⁷⁹ Cameron Myhrvold 8/7/98 Decl. ¶4; 4/21/98 Cameron Myhrvold of Microsoft to Leland C. Thburn: Pl. Ex. 374, at MS98 0106631-32.

Again, given Microsoft's position in operating systems, these provisions were anticompetitive. The purpose and effect was to reduce the ability of competing browser manufacturers to distribute and promote their browsers through leading ISPs. Regardless of whether such provisions would be anticompetitive in themselves if put in place by a company with a small share of operating systems, they are certainly anticompetitive when Microsoft uses them to protect its dominant position in operating systems.

F. *Exclusionary agreements with Internet content providers*

Microsoft also had restrictive agreements with the ICPs that create content for the Internet. ICPs valued the opportunity to have a channel on the Microsoft desktop, because it encouraged users to visit the ICPs' Web sites, which in turn increased the ICPs' ability to promote their own products and to sell advertising space on their Web pages.

Typically, the general nature of the agreements was that, in return for a prominent position on Microsoft's Channel Bar, ICPs agreed not only that they would promote IE, but also that they would not promote or distribute competing browsers. Some of the more restrictive provisions typically included in the agreements were as follows:

- a. An ICP must agree to promote IE and no other browser as the browser software of choice for specified Web sites ("Other browsers" are defined in the contracts as the top two most widely used browsers, exclusive of IE.);
- b. An ICP must not distribute any other browser besides IE as an integral part of any channel client for use on Windows and Macintosh platforms; and
- c. ICPs and their affiliates may not compensate a company that produces other browsers for carrying or promoting the ICPs' content or logos.

While the Channel Bar was not a success, these provisions are worth mentioning. Given Microsoft's position in operating systems, these provisions were anticompetitive, helping to preserve Microsoft's large share of business in operating systems by hin-

dering competition from other browsers. In particular, the provision that prevented ICPs from compensating a company that produces other browsers for carrying or promoting the ICPs' content or logos could have had no purpose other than that of damaging those browser suppliers. Requiring it was not a profitable act by Microsoft independent of its effect on weakening the competition.

G. *Microsoft's conduct limiting the availability and success of cross-platform Java technology*

As discussed previously, Microsoft recognized Sun Microsystems' Java as a threat to its operating system monopoly because Java, like browsers, offered the potential for eroding the applications barrier to entry. Microsoft's anticompetitive actions restrained the use and availability of Java technology in order to protect the current dominance of the Windows operating system.

A Java Runtime Environment (JRE), which consists of a Java virtual machine, the Java platform core classes, and supporting files, is a software layer with its own API set that resides on top of an operating system and is designed to allow applications written in Java to function on different operating systems. Significantly, browsers (i.e., non-Microsoft browsers) are an important distribution channel for JREs.

Microsoft undertook two basic approaches to eliminating the potential competitive threat posed by Java. First, Microsoft, recognizing that Netscape's browser was the primary distribution method for Java, sought to eliminate Java by eliminating Netscape's browser as a viable alternative.⁸⁰ Second, Microsoft took actions to impede the cross-platform potential of Java by develop-

⁸⁰ 7/14/97 re "(not so) random marketing thoughts," Paul Maritz to Moshe Dunie, Bill Gates et al.: Pl. Ex. 113, at MS7 027366; 1/5/97 re "overview slides for Billg/NC&Java session with 14+'s on Monday," Paul Maritz to Bill Gates, Jim Allchin, Ben Slivka, and Brad Silverberg: Pl. Ex. 51, at MS7 005534, 36.

ing an interface called J/Direct. Any application that uses "J/Direct will run only on the Microsoft virtual machine."⁸¹

Microsoft did not seek to "kill cross-platform Java" merely by developing its own version of Java and marketing it on the merits. Instead, Microsoft sought to "kill cross-platform Java" by developing what it termed "polluted Java."⁸² It did this in two principal ways:

1. The default way of writing applications and applets⁸³ for Microsoft's virtual machine causes some of those applications and applets not to be able to run properly on non-Windows platforms or even on non-Microsoft virtual machines running on Windows.⁸⁴
2. If application developers used the software developer tools that Microsoft provided for Java, then (without intending to do so) they would wind up with an application that effectively would not run on non-Windows platforms.

These were not the profit-maximizing actions of a company competing on the merits. Together with its actions against browsers, they were acts specifically directed at the preservation of Microsoft's monopoly power in operating systems.

H. Anticompetitive effects

Microsoft's conduct prevented its browser competitors, principally Netscape, from effectively competing on the merits for new business; artificially raised barriers to entry into both the browser and the operating system markets; and preserved Microsoft's operating system monopoly.

1. THE SIGNIFICANCE OF NEW INSTALLATIONS The vast majority of browser users tend to stay with the browser they receive with their PC or, if not, the browser provided by their ISP.⁸⁵ By ensuring that

virtually all new users receive Microsoft's browser either with their PC or from their ISP or both, Microsoft effectively excluded Netscape and other browser competitors from the market, limiting them to a declining base of existing users.

2. MICROSOFT'S CONDUCT FORECLOSED BROWSER COMPETITORS FROM COMPETING ON THE MERITS Microsoft recognized that it would not be able to compete successfully against Netscape on the merits of IE alone. This was in part because, while no company is perfect, and while Netscape (like Microsoft) made mistakes, Microsoft recognized the strengths of Netscape's product offerings.⁸⁶ Microsoft's response was to exclude Netscape and other browser competitors from the two most important channels of distribution—OEMs and ISPs.

Microsoft succeeded in effectively excluding Netscape almost completely from the personal computer OEM distribution channel. OEMs that license Windows were required to take (and not remove) IE, and for most OEMs, including the largest, that means including only IE with the PCs they ship.

Another important browser distribution channel is through ISPs (including OLSs). Here, Microsoft's restrictive agreements with AOL and CompuServe alone tied up ISPs/OLSs with 65% of the subscribers to ISPs/OLSs considered to be in the "Top 80" by Microsoft at year-end 1997.⁸⁷ Indeed, more than 95% of subscribers to ISPs in the Top 80 subscribe to ISPs that were contractually required to distribute IE preferentially.⁸⁸

Microsoft asserted that its anticompetitive practices did not result in foreclosure because users could download browsers for free from the Internet. But, what is important is not whether users can download a competitor's browser, but whether users *will* download a competitor's browser under prevailing market conditions.

⁸¹ James Gosling 9/10/98 Decl. ¶ 16.

⁸² "VJ98 SKUs and Pricing-Proposal": Pl. Ex. 259, at MS7 033448.

⁸³ Applets are Java programs that are embedded in Web pages.

⁸⁴ James Gosling 9/10/98 Decl. ¶ 16.

⁸⁵ 3/27/97 re "ie data," K. Mehta to Brad Chase et al.: Pl. Ex. 204.

⁸⁶ 5/19/96 re "Some Thoughts on Netscape," Bill Gates to Paul Maritz et al.: Pl. Ex. 41, at MS6 6012952.

⁸⁷ "Netscape Competitive Analysis": Pl. Ex. 835, at MS98 0112834-36.

⁸⁸ Plaintiff's Trial Exhibit 12.

The most important point to remember here, though, is that users prefer to get their browsers installed on their computers because consumers pay in terms of time and trouble to download a browser from the Internet.

For example, as Michael Homer, Netscape's executive vice president and NetCenter general manager, explained in his deposition, "a download may be interrupted, or, even if the download is successful, it still may not be feasible to install the software."⁸⁹ Moreover, according to Homer, ". . . the installation process can be confusing and difficult unless the users are fairly skilled users."⁹⁰

Thus, users are likely to settle for the browser that is already on their operating system. In fact, Microsoft's own studies show that most Internet users have never downloaded a browser. For example, Kumar Mehta of Microsoft reported to Brad Chase and Yusuf Mehdi in March 1997 that "Almost 60% of all surfers have never downloaded any software from the web. My sense is that these people are not very likely to download anything, let alone a browser that takes 2 hours to download, from the web."⁹¹

Microsoft also claimed that competitors could distribute browsers effectively, and that Netscape distributed or had distributed by its partners hundreds of millions of copies of its browser in 1997 and 1998. However, Netscape did not do any of this distribution itself, its own distribution by CD-ROM being "almost none."⁹² Further, mail is a very inefficient distribution method.⁹³ Because it takes time and trouble to install software, customers are unlikely to switch to another browser if they already have a browser that is up and running. Relegating Netscape to

⁸⁹ Michael Homer 8/4/98 Dep. Tr. at 54-55.

⁹⁰ *Id.* at 51-52.

⁹¹ 3/27/97 re "ie data," Kumar Mehta to Brad Chase et al.: Pl. Ex. 204.

⁹² Michael Homer 8/4/98 Dep. Tr. at 70.

⁹³ Unlike firms such as AOL, the result of such distribution would not bring a steady stream of revenues to Netscape.

distributing its software by mail was simply a means of raising rivals' costs.

3. BROWSER USAGE—THE RELEVANT MEASURE In evaluating the effectiveness of Microsoft's actions on browser competition, it is important to realize that the relevant measure is Microsoft's share of browser *usage*. In terms of the protection of the applications barrier to entry, what matters is the browser technologies and APIs that software writers observe in use. For that purpose, shares of browsers distributed are irrelevant. (Moreover, if that were the measure, Microsoft's share would be enormous given the bundling and forcing of IE.) Further, what is important here is not whether Microsoft forced Netscape's share to zero, but rather whether Microsoft successfully prevented Navigator from becoming the prevalent browser of choice.

The evidence of Microsoft's foreclosure of Netscape and other browser competitors can be seen by comparing Microsoft's share of browsers distributed by ISPs that made IE their default browser with that of ISPs that did not make IE their default browser.⁹⁴ At the end of 1997 Microsoft enjoyed a 94% weighted average share of browser shipments by ISPs who agreed to make IE their default browser, compared with a 14% weighted average share of browser shipments by ISPs who did not make IE their default browser. Further, Microsoft's weighted average share of browser usage by subscribers to ISPs who made IE their default browser was over 60%. In contrast, Microsoft's weighted average share of browser usage by subscribers to ISPs who did not make IE their default was less than 20%.

The difference in IE usage across subscribers of different ISPs can also be analyzed by looking at IE's share of "hits" as reported by AdKnowledge, Inc., a company that develops and markets advertisement management products for the World Wide Web. A sample of AdKnowledge data was obtained in order to analyze how Microsoft's share of the browser market varies across ISPs, some of whom entered into agreements to distribute IE preferentially, and some of whom did not enter into any such agreements.

⁹⁴ See Plaintiff's Trial Exhibit 11.

While the AdKnowledge data are not as complete as one might wish,⁹⁵ they show trends that are unmistakable.

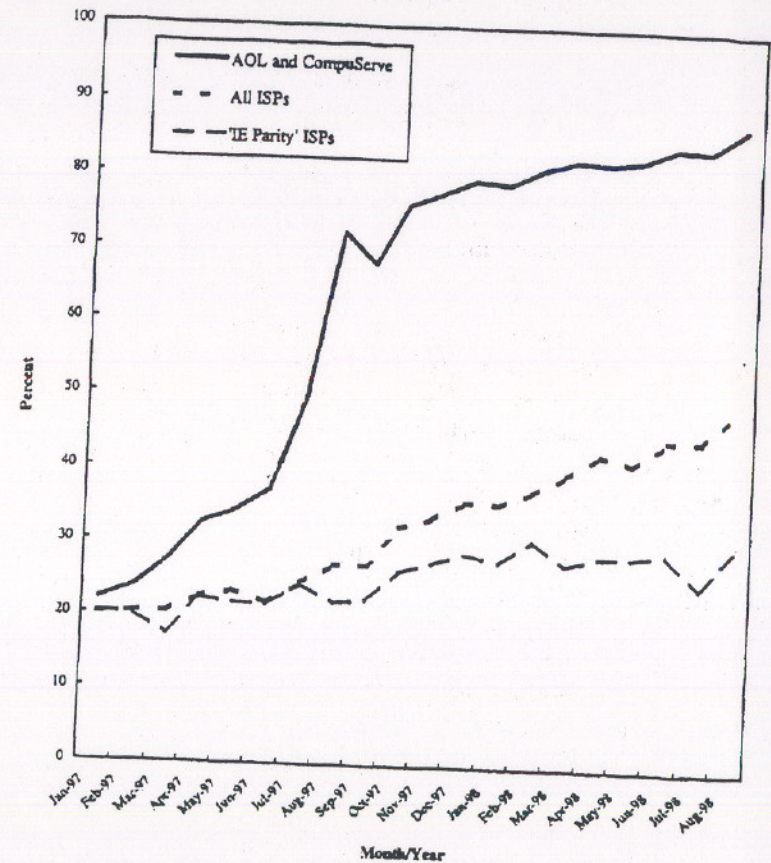
The figure, Plaintiff's Trial Exhibit 4, shows Microsoft's monthly share of browser usage by three categories of ISPs, from January 1997 through August 1998. The top line shows Microsoft's share of usage among subscribers to AOL and CompuServe rising sharply. These companies (now merged) were chosen because they represent the largest ISPs (with a total of more than 11.5 million subscribers and about 65% of all subscribers to services in the Top 80 as of year-end 1997), and because AOL and CompuServe, as online service providers, were contractually restricted in their promotion and distribution of non-IE browsers to a greater extent than were most other ISPs.

The middle line shows Microsoft's share for all ISPs. The bottom line shows Microsoft's share for the ISPs within the Top 80 which Microsoft listed as having "IE Parity" (ISPs whose browser choice was not known to be contractually restricted), which had 10,000 or more subscribers, and for which data were available.

The effects are striking. Microsoft's share of "IE Parity" browser usage—the category that is contractually neutral—rises in 20 months from 20% to just under 30%. This rise includes the effects of technological improvement in IE as well as the effects of Microsoft's bundling and tying. By contrast, the All ISPs line shows an increase in Microsoft's share from 20% to 49%. Finally, for AOL and CompuServe, Microsoft's share rose from just over 20% to over 87%. (It is worth noting that the dramatic jump in

that share occurred *before* the introduction of IE 4—the improved version of IE—in October 1997⁹⁶).

Figure
Plaintiff's Exhibit 4



SOURCE: AdKnowledge, Inc.
Pl. Ex. 1092. MS98 0112834-36

⁹⁵ For example, not every ISP can be readily individually identified in the AdKnowledge data. The domain names, and thus the data for some of the ISPs could not be found. Further, hits by AOL subscribers are underrepresented because of AOL's use of "caching," a device that makes repeated hits on a given page by the same or different AOL subscriber occur through AOL's own server rather than in a manner measured by AdKnowledge. In the way in which we have used the data, this phenomenon leads to an understatement of the effects of Microsoft's restrictive practices.

⁹⁶ Contrary to claims made by Microsoft, the use of the "IE Parity" group as a control group is not invalidated by the fact that some members of that group chose to offer Netscape Navigator as their default browser. Those choices, made by companies that were not contractually obligated to do so, were choices made to best serve subscribers.

The exclusion of Netscape and other browser competitors from the OEM channel has been even greater. Although several OEMs (including the largest, Compaq) have sought to replace IE with Netscape, none is now permitted to do so. And, the fact that IE is required to be included means in most cases that only IE will be included.⁹⁷

4. MICROSOFT'S BROWSER MARKET SHARE IS NOW HIGH AND INCREASING Because of their innovations and success in creating and distributing the world's first widely used browser, Netscape initially had a very large share of the browser market. Microsoft's browser share at the beginning of calendar year 1997 was approximately 20%, and had been significantly lower earlier.

It is difficult to measure precisely how the share has changed over time, for several reasons. First, most share statistics are browser usage shares that reflect the usage of all browsers whenever acquired; because of Netscape's large (and Microsoft's relatively small) share prior to 1997, present usage shares significantly understate Microsoft's share of current browser acquisitions. Second, usage shares are sometimes based on the number of browser users (in which case each browser used in the period measured is counted equally regardless of how often it is used in the period) and sometimes based on the number of times browsers are used in the period (in which case a browser is counted each time it is used). Regardless of how share is measured, however, it is clear that Microsoft's browser share increased dramatically, and Netscape's browser fell sharply, over the years

⁹⁷ Judge Jackson distinguished three categories of Internet access providers (IAPs). "One category was hits originating from subscribers to IAPs that, according to a chart prepared by Microsoft for its internal use, were not subject to any distribution or promotion restrictions. Another category was hits originating from subscribers to any IAP. A third category was hits originating from subscribers to AOL and CompuServe. . . . The differences in the degree of Internet Explorer's success in the three categories reveal the exclusionary effect of Microsoft's interdiction of Navigator in the IAP channel." (¶ 310).

1997 and 1998.⁹⁸ Indeed, as shown below, Microsoft's browser share continued to increase through 1999 as well, reaching nearly 80% in December of that year—6 months after the taking of evidence in the case.

The AdKnowledge data show that Microsoft's share of incremental browser usage for the 20 months ending in August 1998 was 57% and that Netscape's incremental share of browser usage was 40% over the same period (Plaintiff's Trial Exhibits 6 and 7). Since the incremental usage shares reflect increased usage of previously installed browsers, as well as the usage of browsers acquired during the period, even these incremental usage shares understate Microsoft's share (and overstate Netscape's share) of usage of new browsers.

Thus there is substantial evidence that Microsoft's anticompetitive actions have permitted it to retain its power over price in operating systems and to inhibit development of Microsoft-independent innovations. Both harm consumer welfare.

Microsoft's anticompetitive actions are aimed at hindering the success of non-IE browsers, but they are likely to send a message to all software developers: Microsoft will impede any innovation that threatens Microsoft's monopoly in operating systems. This will lessen developers' incentives to develop products that provide alternatives to the Windows platform. As a result, the range of software products consumers can choose from will be limited. Narrowed choice and slowed technological progress can never improve the welfare of consumers and are likely to decrease it. If

⁹⁸ For example, on February 6, 1998, Microsoft estimated its share of the browser market had increased from 6% in June 1996, to 31% in June 1997, to 40% in December 1997, and to 45% in January 1998, and projected that Microsoft's share would increase to 57% in June 1999, to 61% in June 2000, and to 65% in June 2001. (2/6/98 Haas to Chase et al.: Pl. Ex. 310 and Pl. Ex. 14) Further, data from AdKnowledge show Microsoft's share of browser usage increasing from 20% in January 1997 to 49% in August 1998. Microsoft's incremental share (the change in IE users divided by the change in total users) is even higher. Microsoft estimates that its incremental share of users for the last 6 months of 1997 was 57%. (Plaintiff's Trial Exhibit 8)

Windows were truly a superior product, it would succeed on its merits. The actions Microsoft took prevented that from being necessary.⁹⁹

5. MICROSOFT IS ATTEMPTING TO MONOPOLIZE THE BROWSER MARKET
Microsoft used its monopoly power over PC operating systems to secure monopoly power over Internet browsers. While Microsoft had not succeeded in monopolizing browsers at the time of the trial, Microsoft's browser market share had grown significantly and Netscape's browser market share had declined significantly from 1996 to the middle of 1998. As described in detail above, several sources indicate that Microsoft enjoyed a browser market share of about 50% or more at the time of trial. As already mentioned, more recent evidence shows that Microsoft's browser share has continued to grow through the present.

To the extent that Microsoft does succeed in acquiring a monopoly in Internet browsers, the monopoly will be protected by substantial barriers to entry. With ownership of the desktop, Microsoft can easily control the most common browser distribution channels, including distribution through OEMs and ISPs. Without an effective method of distribution, competitors' browsers pose little threat to IE. Moreover, natural barriers to entry would protect Microsoft's browser market share. Developers would tend to create Web sites accommodating the dominant IE technology, which would increase users' demand for IE, generating a cycle that would reinforce IE's monopoly in the browser market.

⁹⁹ In the court's view, "Microsoft's efforts to maximize Internet Explorer's share of browser usage at Navigator's expense have done just that. The period since 1996 has witnessed a large increase in the usage of Microsoft's browsing technologies and a concomitant decline in Navigator's share. This reversal of fortune might not have occurred had Microsoft not improved the quality of Internet Explorer, and some part of the reversal is undoubtedly attributable to Microsoft's decision to distribute Internet Explorer with Windows at no additional charge. The relative shares would not have changed nearly as much as they did, however, had Microsoft not devoted its monopoly power and monopoly profits to precisely that end." (¶358)

As already discussed, Microsoft's monopoly in the market for Internet browsers would reinforce its monopoly over PC operating systems by preserving the barrier to entry created by network effects. Microsoft's dominance of the market for Internet browsers would also reinforce its monopoly over PC operating systems because a potential competitor in operating systems would need access to a compatible browser to be commercially viable. Thus, entry into the operating systems market would require either (1) entry into the browser market, where the entrant would face the network effects and other barriers to entry described above; or (2) the cooperation of Microsoft to make IE compatible with the competitor's operating system. If developers of competing operating systems did not have the open access to the IE technology that they would need to ensure compatibility, they would be at a constant disadvantage in providing a viable alternative to Windows in a timely fashion.

V. Concluding comments

A. Consumer harm

We believe that Microsoft engaged in a number of anticompetitive actions. In particular, taken together with other actions, the pricing of Microsoft's browser was anticompetitive; absent any expected deleterious effects on competition, the pricing would not be profit-maximizing. Moreover, any foregone profits associated with its anticompetitive conduct can be recouped through the protection of Microsoft's operating system monopoly.

If Microsoft's IE browser and Windows operating system are superior products, then competition will lead OEMs, ISPs, ICPs, and customers to choose them, and Microsoft need not have artificially influenced those choices. But Microsoft has engaged in conduct that has no compelling economic justification but for its effect of restricting competition. These actions have allowed Microsoft to protect its monopoly in the market for operating sys-

tems and to move toward establishing a monopoly in the market for browsers.¹⁰⁰

Judge Jackson's findings of fact support the view that Microsoft's anticompetitive acts caused immediate harm. According to the court

To the detriment of consumers, however, Microsoft has done much more than develop innovative browsing software of commendable quality and offer it bundled with Windows at no additional charge. As has been shown, Microsoft also engaged in a concerted series of actions designed to protect the applications barrier to entry, and hence its monopoly power, from a variety of middleware threats, including Netscape's Web browser and Sun's implementation of Java. Many of these actions have harmed consumers in ways that are immediate and easily discernible. They have also caused less direct, but nevertheless serious and far-reaching, consumer harm by distorting competition. [¶409]

By refusing to offer those OEMs who requested it a version of Windows without Web browsing software, and by preventing OEMs from removing IE—or even the most obvious means of invoking it—prior to shipment, Microsoft forced OEMs to ignore consumer demand for a browserless version of Windows. . . . By ensuring that IE would launch in certain circumstances in Windows 98 even if Navigator were set as the default, and even if the consumer had removed all conspicuous means of invoking IE, Microsoft created confusion and frustration for consumers, and increased technical support costs for business customers. Those Windows purchasers who did not want browsing software . . . not only had to undertake the effort necessary to remove the visible means of invoking IE and then contend with the fact that IE would nevertheless launch in certain cases; they also had to . . . content themselves with a PC system that ran slower and provided less available memory than if the newest version of Windows came without browsing software. By constraining the freedom of OEMs to implement certain software programs in the Windows boot sequence, Microsoft foreclosed an opportunity for OEMs to make

¹⁰⁰ Our conclusion follows not simply from the fact that consumer choices were reduced, since as a conceptual matter, some product changes or marketing practices may harm some consumers, while benefiting others. Rather, we believe that Microsoft's conduct would not have been undertaken (because it was not otherwise profitable), but for the exclusion of competitors and the opportunity to recoup by maintaining and increasing monopoly power in its operating system.

Windows PC systems less confusing and more user-friendly, as consumers desired. By taking the actions listed above, and by enticing firms into exclusivity arrangements with valuable inducements that only Microsoft could offer and that the firms reasonably believed they could not do without, Microsoft forced those consumers who otherwise would have elected Navigator as their browser to either pay a substantial price (in the forms of downloading, installation, confusion, degraded system performance, and diminished memory capacity) or content themselves with IE. Finally, by pressuring Intel to drop the development of platform-level NSP software, and otherwise to cut back on its software development efforts, Microsoft deprived consumers of software innovation that they very well may have found valuable, had the innovation been allowed to reach the marketplace. None of these actions had pro-competitive justifications. [¶410]

Many of the tactics that Microsoft has employed have also harmed consumers indirectly by unjustifiably distorting competition. The actions that Microsoft took against Navigator hobbled a form of innovation that had shown the potential to depress the applications barrier to entry sufficiently to enable other firms to compete effectively against Microsoft in the market for Intel-compatible PC operating systems. That competition would have conduced to consumer choice and nurtured innovation. The campaign against Navigator also retarded widespread acceptance of Sun's Java implementation. . . . It is clear . . . that Microsoft has retarded, and perhaps altogether extinguished, the process by which . . . middleware technologies could have facilitated the introduction of competition into an important market. [¶411]

Most harmful of all is the message that Microsoft's actions have conveyed to every enterprise with the potential to innovate in the computer industry. Through its conduct toward Netscape, IBM, Compaq, Intel, and others, Microsoft has demonstrated that it will use its prodigious market power and immense profits to harm any firm that insists on pursuing initiatives that could intensify competition against one of Microsoft's core products. Microsoft's past success in hurting such companies and stifling innovation deters investment in technologies and businesses that exhibit the potential to threaten Microsoft. The ultimate result is that some innovations that would truly benefit consumers never occur for the sole reason that they do not coincide with Microsoft's self-interest. [¶412]

B. The Microsoft perspective—in retrospect¹⁰¹

Microsoft's economic testimony and commentary have tended to misdirect attention to the wrong issues and thereby caused some confusion. We conclude with some brief comments about those significant issues.

1. MARKET DEFINITION AND PLATFORM COMPETITION Microsoft's economic expert, Richard Schmalensee has argued that the government's case turned on a misconceived market definition and that, had it (and we) only perceived that the true competition was one of platforms rather than operating systems, its case would have fallen of its own weight. In fact, it is their argument that depends on a tortured market definition; ours is essentially independent of the market defined—as it should be.

According to Professor Schmalensee, the government defined the market too narrowly as including only PC operating systems. Schmalensee's position was that, since Netscape's Navigator and Sun's Java—both middleware—provided platforms to which software developers could write applications, they were competing with Microsoft in the “platform market,” and Microsoft's actions merely represented aggressive competition in that market.

First, as to market definition: The object of market definition in a monopoly case is (and ought to be) to provide the basis for an analysis of the constraints on an alleged monopolist's power. That means the constraints on its power in dealing with *buyers*, not the constraints on its dealing with the producers of complementary products. If Windows were and would remain the only *operating system* for Intel-based PCs, then every owner of a PC using Navigator or Java would of necessity require Windows. And that would be true regardless of how many applications were written for the middleware. Navigator and Java were *complements* to the operating system. They also could facilitate the writing of applications that were also complements. They were not substitutes.

¹⁰¹ This subsection contains retrospective commentary.

That does not mean that Navigator and Java presented no threat to Microsoft. On the contrary, they presented a threat that Microsoft greatly feared. If enough users acquired Navigator or Java, then applications writers might find it tempting to write for them. If this happened to a great enough extent, then it might not matter what operating system ran underneath them. In Microsoft's words the operating system would become “commoditized,” and the applications barrier to entry would be gone. Thus Navigator and Java were facilitating devices that had the potential to aid the entry of competing operating systems. The competition that Microsoft feared would come from that entry and not directly from Navigator and Java.

Professor Schmalensee's position is that the fact that Microsoft found it necessary to attack Navigator and Java must mean that those products were in the same market as Windows. But this is incorrect. Imagine that someone invented an automobile that would run on some fuel in addition to or other than gasoline, say root beer. A monopolist of gasoline might well attempt to destroy that invention lest competition from root beer erode its monopoly position and profits. But one would hardly wish to say that the root-beer-driven *automobile* was in the same market as gasoline, even though its success could bring root beer into that market.

Second, the correct analysis should not be driven by the market definition. Even if one includes Navigator and Java in the same market as Windows, the analysis of Microsoft's actions would basically be the same. In that case, one would say that Microsoft took predatory actions to destroy two existing competitors who were introducing innovations that could lead to other entry.

2. INNOVATION TO ENHANCE THE SALE OF WINDOWS It is not surprising that Professor Schmalensee took the position that Microsoft's actions only involved product improvements that enhanced the sale of Windows. But

- a. The browser is an important complement to the operating system. Microsoft had an interest in ensuring that there was a good browser that would work with Windows. But, if that were all,

there would be no reason to spend hundreds of millions of dollars ensuring that the most heavily-used browser would not be Netscape's;

- b. Microsoft spent considerable effort to force Apple to make IE the browser of choice. That cannot have contributed to the sale of Windows;
- c. As this suggests, Microsoft did not merely innovate and improve IE. It forced many others (e.g., Apple, Internet service providers, and Internet content providers such as Intuit) into restrictive agreements hampering the distribution and use of Navigator; and
- d. One should not forget that Microsoft was not doing this because IE was a source of revenue. To the contrary, IE was a "no revenue product."¹⁰² Microsoft sacrificed ancillary revenues that IE might bring if an OEM or ISP wanted to feature a browser that used the IE technology under a different name and with a different portal site.

It is total misdirection to suggest that *Microsoft* was about the improvement of the browser, or even primarily about its integration or bundling into Windows. What it was largely about was Microsoft's restrictive actions. These included its refusal to offer Windows without IE—i.e., to sell Windows both with and without IE. But there was far more than this involved.

3. THE EFFECT OF MICROSOFT'S ACTIONS ON BROWSER SHARES
According to Professor Schmalensee, Microsoft did not succeed in hampering Netscape and the threat it posed. He argued both that Netscape's distribution of Navigator continued to be extremely large and that Netscape's success is shown by the \$4 billion purchase price offered by AOL when the deal was struck.¹⁰³ Both points are misleading.

Professor Schmalensee argued that Netscape continued to distribute its browser, stating "Netscape told Goldman Sachs that it distributed 160 million copies of Navigator in 1998. That works

¹⁰² Government Exhibit 39.

¹⁰³ See DAVID S. EVANS & RICHARD SCHMALENSEE, BE NICE TO YOUR RIVALS: HOW THE GOVERNMENT IS SELLING AN ANTITRUST CASE WITHOUT CONSUMER HARM in *U.S. v. Microsoft* (American Enterprise Institute/Brookings Institution, forthcoming).

out to about 1.6 copies for every Web user." But that second sentence should provide a clue that something is amiss here. On that basis, every Web user has at least one, and many have more than one copy of Navigator. On that basis, since IE is bundled with Windows, just about every PC user has IE as well.

The problem is that the possibility of reaching consumers with Navigator does not translate into reaching them effectively, into browser usage, or even into installation. Professor Schmalensee claims that Netscape was not foreclosed by Microsoft's actions. For example, Microsoft did not prohibit OEMs from installing Navigator in addition to IE, and Netscape could distribute Navigator by "carpet bombing"—mailing CD-Rom disks—or through downloading.

But Microsoft did not have to prohibit OEMs from installing Netscape to ensure that most of them would not do so. Once IE became roughly equal in quality to Navigator, there was no very good reason for OEMs to ship two browsers and some reason (space on the desktop and disk, possible user confusion) not to do so. In fact, such shipments dropped sharply.

Similarly, Microsoft tied up the second major distribution channel, signing restrictive agreements with ISPs and OLSs which *explicitly* kept them from shipping "other browsers" (read "Navigator") to more than a small fraction of their customers. Significantly, when, with the litigation about to begin, Microsoft waived such restrictions for many ISPs, it did so neither for the major OLSs (AOL, CompuServe, and Prodigy) nor for AT&T.

Of course, it remained true that Netscape was not cut off completely from customers. One exhibit sponsored by Professor Schmalensee showed Navigator being delivered by parachutists. But "carpet bombing" is costly and the downloading of a complicated browser is often ineffective. Consumers properly hesitate before undertaking such a task, particularly when a perfectly good browser already comes with their machine.¹⁰⁴

¹⁰⁴ The MDC survey data on which Professor Schmalensee relied for propositions as to how consumers obtained their browsers are unreliable (as the court found—Findings of Fact ¶371). On this very point, the

In any event, it is browser *usage* that matters here, not browser opportunity or browser ownership or even browser installation. Microsoft's fear was that software application writers would shift to writing for Navigator rather than for Windows, thus weakening the applications barrier to entry into operating systems. This could happen if Navigator became very widely *used* relative to IE. It would not happen if Navigator was merely widely distributed or even widely installed and not used.

Significantly, the evidence as to the shift in share of browser *usage* is overwhelming. Its claims to the contrary, Microsoft's attempt to dominate the browser market has been extremely successful. The AdKnowledge data used by the government at trial and described in our primary paper clearly show this. Indeed, this can be seen by looking at a more recent source of hit data. According to Statmarket.com (which receives information from over 33 million Internet users visiting over 130,000 Web sites), IE's share of total browser usage reached 75.3% by August 2, 1999 and continued to grow to 79.4% on December 6, 1999.

4. THE AOL ACQUISITION OF NETSCAPE Why then did AOL pay such a high price for Netscape? AOL bought a company with an Internet portal (and said so). The agreed-on price of \$4 billion was in line with other such purchases. The browser wars were over, and the browser was not important in the purchase.

Professor Schmalensee made much (as Microsoft did at trial) of the AOL acquisition of Netscape, pointing out that, *if* AOL were to switch its subscribers to Navigator, it would make a substantial difference in browser shares.

In the words of the Spartan reply to the Persians who told them what would happen if they were conquered, we reply: "If." We showed above that this is unlikely to happen, since the potential value for the AOL-Netscape combination of AOL's adopting

unreliability is shown by the fact that users of Windows 98, all of whom received IE with that operating system give inconsistent answers. For example, AOL users who were not accessing the Web and therefore not using an Internet browser to browse the Web were included in MDC's browser share data.

the Netscape browser is not particularly greater after the merger than before it. This is one of the occasions on which economists' forecasts are correct. Fisher first made this point immediately following the merger. In fact, AOL did not make such a switch when it could and announced (and testified) that it has no intention of doing so.

Moreover, even were AOL to change its mind, the time is already past when the Navigator threat to the applications barrier to entry was truly alive. IE's share of browser usage was about 80% by the end of 1999. To thwart the threat did not require that Navigator disappear, merely that it not become and remain the browser of choice for a large majority of users.

Finally, even if there were still a possibility that Navigator could undo the harm that it has suffered and substantially increase market share, Microsoft's anticompetitive actions intended to prevent it doing so would not be excused. Indeed, in light of the clarity of the Microsoft statements about why it was engaging in those actions, it is hard to credit the view that Microsoft itself believed that they did not matter.

5. THE USE OF INTENT EVIDENCE In this article (and in Fisher's testimony), we have relied in part on Microsoft's own statements. Professor Schmalensee has criticized such use, appropriately quoting at length from Fisher's book on the *IBM* case¹⁰⁵ on the dangers of relying on intent evidence. We stand by that quotation, but it is inapplicable here.

The quotation begins (emphasis added):

The subjective intent of a company is difficult to determine and will *usually* reflect nothing more than a determination to win all possible business from rivals—a determination consistent with competition.

The operative word is "usually." The quoted passage was written in the light of the *IBM* case, where the "usual" circumstance applied. The overwhelming flood of statements from Microsoft's

¹⁰⁵ FRANKLIN M. FISHER, JOHN J. MCGOWAN, & JOEN GREENWOOD, *FOLDED, SPINDLED, AND MUTILATED: ECONOMIC ANALYSIS AND U.S. v. IBM* 272 (1983).

executives and other employees does not leave much ambiguity as to what was happening in this case.

Moreover, intent evidence can play a valuable role in a different way. Where the defendant claims to have taken actions for other, procompetitive ends, clear contemporaneous statements about intent can assist in evaluating that claim.

6. INNOVATION AND THE ANTITRUST LAWS As of this writing, indeed, it seems that the only lesson that Microsoft has learned from the case is that it should be cautious with its e-mails.¹⁰⁶ Before, during, and after the trial, Microsoft has mounted a consistent public relations campaign claiming that it is being persecuted because it is innovative and that antitrust policy is somehow inapplicable to an innovative firm or industry. Claims have also been made that the Antitrust Division has used "an antiquated antitrust tool kit."¹⁰⁷

But the "antitrust tool kit" is not "antiquated." Indeed and to the contrary, the Antitrust Division has used modern antitrust tools to analyze a range of competition issues in which innovation played a significant role.¹⁰⁸ Further, the fact that a firm is innovative does not give it a license to engage in anticompetitive activities designed to preserve monopoly power. Innovation, to be sure, may make it harder to decide when acts are anticompetitive, but it does not excuse them. Microsoft was not sued because of its innovations. Even the integration of the browser was not, taken alone, necessarily anticompetitive (although refusing to sell Windows and IE separately surely was).

Nor is the fact that an industry is innovative a reason to exempt it from antitrust scrutiny and liability. If it were, then firms would have every incentive to cloak their anticompetitive acts in a mantle (and mantra) of innovation. Despite the fact that

¹⁰⁶ And it is not clear that it has even learned that. Some of the e-mails introduced at trial were written well after the trial had begun.

¹⁰⁷ See EVANS & SCHMALENSSEE, *supra* note 103.

¹⁰⁸ See, e.g., Rubinfeld & Hoven, *Innovation and Antitrust Enforcement* (Cambridge University Press book, forthcoming).

the presumption that competition leads to consumer benefits comes from static propositions, a rule of law that protected attacks on competition in innovative industries would be an invitation to predation.

To paraphrase the words of Ernestine, Lily Tomlin's telephone operator, Microsoft's attitude to the entire antitrust process has been "We are Microsoft. We are innovative. *We are om-ni-po-tent.*" Fortunately for the rest of us, they aren't.