United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT

Argued February 26 and 27, 2001

Decided June 28, 2001

No. 00–5212

UNITED STATES OF AMERICA,
APPELLEE

v.

MICROSOFT CORPORATION,
APPELLANT

Consolidated with
00–5213

Appeals from the United States District Court
for the District of Columbia
(No. 98cv01232)
(No. 98cv01233)

Richard J. Urowsky and *Steven L. Holley* argued the causes for appellant. With them on the briefs were *John L.*

Bills of costs must be filed within 14 days after entry of judgment. The court looks with disfavor upon motions to file bills of costs out of time.

Warden, *Richard C. Pepperman, II*, *William H. Neukom*, *Thomas W. Burt*, *David A. Heiner, Jr.*, *Charles F. Rule*, *Robert A. Long, Jr.*, and *Carter G. Phillips*. *Christopher J. Meyers* entered an appearance.

Lars H. Liebeler, Griffin B. Bell, Lloyd N. Cutler, Louis R. Cohen, C. Boyden Gray, William J. Kolasky, William F. Adkinson, Jr., Jeffrey D. Ayer, and *Jay V. Prabhu* were on the brief of *amici curiae* The Association for Competitive Technology and Computing Technology Industry Association in support of appellant.

David R. Burton was on the brief for *amicus curiae* Center for the Moral Defense of Capitalism in support of appellant.

Robert S. Getman was on the brief for *amicus curiae* Association for Objective Law in support of appellant.

Jeffrey P. Minear and *David C. Frederick*, Assistants to the Solicitor General, United States Department of Justice, and *John G. Roberts, Jr.*, argued the causes for appellees. With them on the brief were *A. Douglas Melamed*, Acting Assistant Attorney General, United States Department of Justice, *Jeffrey H. Blattner*, Deputy Assistant Attorney General, *Catherine G. O'Sullivan, Robert B. Nicholson, Adam D. Hirsh, Andrea Limmer, David Seidman*, and *Christopher Sprigman*, Attorneys, *Eliot Spitzer*, Attorney General, State of New York, *Richard L. Schwartz*, Assistant Attorney General, and *Kevin J. O'Connor,* Office of the Attorney General, State of Wisconsin.

John Rogovin, Kenneth W. Starr, John F. Wood, Elizabeth Petrela, Robert H. Bork, Jason M. Mahler, Stephen M. Shapiro, Donald M. Falk, Mitchell S. Pettit, Kevin J. Arquit, and *Michael C. Naughton* were on the brief for *amici curiae* America Online, Inc., et al., in support of appellee. *Paul T. Cappuccio* entered an appearance.

Lee A. Hollaar, appearing *pro se*, was on the brief for *amicus curiae* Lee A. Hollaar.

Carl Lundgren, appearing *pro se*, was on the brief for *amicus curiae* Carl Lundgren.

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Before: EDWARDS, *Chief Judge*, WILLIAMS, GINSBURG, SENTELLE, RANDOLPH, ROGERS and TATEL, *Circuit Judges*.

Opinion for the Court filed *Per Curiam*.

Per Curiam: Microsoft Corporation appeals from judgments of the District Court finding the company in violation of §§ 1 and 2 of the Sherman Act and ordering various remedies.

The action against Microsoft arose pursuant to a complaint filed by the United States and separate complaints filed by individual States. The District Court determined that Microsoft had maintained a monopoly in the market for Intel-compatible PC operating systems in violation of § 2; attempted to gain a monopoly in the market for internet browsers in violation of § 2; and illegally tied two purportedly separate products, Windows and Internet Explorer ("IE"), in violation of § 1. *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30 (D.D.C. 2000) ("*Conclusions of Law*"). The District Court then found that the same facts that established liability under §§ 1 and 2 of the Sherman Act mandated findings of liability under analogous state law antitrust provisions. *Id.* To remedy the Sherman Act violations, the District Court issued a Final Judgment requiring Microsoft to submit a proposed plan of divestiture, with the company to be split into an operating systems business and an applications business. *United States v. Microsoft Corp.*, 97 F. Supp. 2d 59, 64–65 (D.D.C. 2000) ("*Final Judgment*"). The District Court's remedial order also contains a number of interim restrictions on Microsoft's conduct. *Id.* at 66–69.

Microsoft's appeal contests both the legal conclusions and the resulting remedial order. There are three principal aspects of this appeal. First, Microsoft challenges the District Court's legal conclusions as to all three alleged antitrust violations and also a number of the procedural and factual foundations on which they rest. Second, Microsoft argues that the remedial order must be set aside, because the District Court failed to afford the company an evidentiary hearing on disputed facts and, also, because the substantive provisions of the order are flawed. Finally, Microsoft asserts that the trial judge committed ethical violations by engaging in impermissible *ex parte* contacts and making inappropriate public comments on the merits of the case while it was pending. Microsoft argues that these ethical violations compromised the District Judge's appearance of impartiality, thereby necessitating his disqualification and vacatur of his Findings of Fact, Conclusions of Law, and Final Judgment.

After carefully considering the voluminous record on appeal—including the District Court's Findings of Fact and Conclusions of Law, the testimony and exhibits submitted at trial, the parties' briefs, and the oral arguments before this court—we find that some but not all of Microsoft's liability challenges have merit. Accordingly, we affirm in part and reverse in part the District Court's judgment that Microsoft violated § 2 of the Sherman Act by employing anticompetitive means to maintain a monopoly in the operating system market; we reverse the District Court's determination that Microsoft violated § 2 of the Sherman Act by illegally attempting to monopolize the internet browser market; and we remand the District Court's finding that Microsoft violated § 1 of the Sherman Act by unlawfully tying its browser to its operating system. Our judgment extends to the District Court's findings with respect to the state law counterparts of the plaintiffs' Sherman Act claims.

We also find merit in Microsoft's challenge to the Final Judgment embracing the District Court's remedial order. There are several reasons supporting this conclusion. First, the District Court's Final Judgment rests on a number of liability determinations that do not survive appellate review; therefore, the remedial order as currently fashioned cannot stand. Furthermore, we would vacate and remand the remedial order even were we to uphold the District Court's liability determinations in their entirety, because the District Court failed to hold an evidentiary hearing to address remedies-specific factual disputes.

Finally, we vacate the Final Judgment on remedies, because the trial judge engaged in impermissible *ex parte* contacts by holding secret interviews with members of the media and made numerous offensive comments about Microsoft officials in public statements outside of the courtroom, giving rise to an appearance of partiality. Although we find no evidence of actual bias, we hold that the actions of the trial judge seriously tainted the proceedings before the District Court and called into question the integrity of the judicial process. We are therefore constrained to vacate the Final Judgment on remedies, remand the case for reconsideration of the remedial order, and require that the case be assigned to a different trial judge on remand. We believe that this disposition will be adequate to cure the cited improprieties.

In sum, for reasons more fully explained below, we affirm in part, reverse in part, and remand in part the District Court's judgment assessing liability. We vacate in full the Final Judgment embodying the remedial order and remand the case to a different trial judge for further proceedings consistent with this opinion.

I. Introduction

A. Background

In July 1994, officials at the Department of Justice ("DOJ"), on behalf of the United States, filed suit against Microsoft, charging the company with, among other things, unlawfully maintaining a monopoly in the operating system market through anticompetitive terms in its licensing and software developer agreements. The parties subsequently entered into a consent decree, thus avoiding a trial on the merits. *See United States v. Microsoft Corp.*, 56 F.3d 1448 (D.C. Cir. 1995) ("*Microsoft I*"). Three years later, the Justice Department filed a civil contempt action against Microsoft for allegedly violating one of the decree's provisions. On appeal from a grant of a preliminary injunction, this court held that Microsoft's technological bundling of IE 3.0 and 4.0 with Windows 95 did not violate the relevant provision of the consent decree. *United States v. Microsoft Corp.*, 147 F.3d 935 (D.C. Cir. 1998) ("*Microsoft II*"). We expressly reserved the question whether such bundling might independently violate §§ 1 or 2 of the Sherman Act. *Id.* at 950 n.14.

On May 18, 1998, shortly before issuance of the *Microsoft II* decision, the United States and a group of State plaintiffs filed separate (and soon thereafter consolidated) complaints, asserting antitrust violations by Microsoft and seeking preliminary and permanent injunctions against the company's allegedly unlawful conduct. The complaints also sought any "other preliminary and permanent relief as is necessary and appropriate to restore competitive conditions in the markets affected by Microsoft's unlawful conduct." Gov't's Compl. at 53, *United States v. Microsoft Corp.*, No. 98–1232 (D.D.C. 1999). Relying almost exclusively on Microsoft's varied efforts to unseat Netscape Navigator as the preeminent internet browser, plaintiffs charged four distinct violations of the Sherman Act: (1) unlawful exclusive dealing arrangements in violation of § 1; (2) unlawful tying of IE to Windows 95 and Windows 98 in violation of § 1; (3) unlawful maintenance of a monopoly in the PC operating system market in violation of § 2; and (4) unlawful attempted monopolization of the internet browser market in violation of § 2. The States also brought pendent claims charging Microsoft with violations of various State antitrust laws.

The District Court scheduled the case on a "fast track." The hearing on the preliminary injunction and the trial on the merits were consolidated pursuant to FED. R. CIV. P. 65(a)(2). The trial was then scheduled to commence on September 8, 1998, less than four months after the complaints had been filed. In a series of pretrial orders, the District Court limited each side to a maximum of 12 trial witnesses plus two rebuttal witnesses. It required that all trial witnesses' direct testimony be submitted to the court in the form of written declarations. The District Court also made allowances for the use of deposition testimony at trial to prove subordinate or predicate issues. Following the grant of three brief continuances, the trial started on October 19, 1998.

After a 76–day bench trial, the District Court issued its Findings of Fact. *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. 1999) ("*Findings of Fact*"). This triggered two independent courses of action. First, the District Court established a schedule for briefing on possible legal conclusions, inviting Professor Lawrence Lessig to participate as *amicus curiae*. Second, the District Court referred the case to mediation to afford the parties an opportunity to settle their differences. The Honorable Richard A. Posner, Chief Judge of the United States Court of Appeals for the Seventh Circuit, was appointed to serve as mediator. The parties concurred in the referral to mediation and in the choice of mediator.

Mediation failed after nearly four months of settlement talks between the parties. On April 3, 2000, with the parties' briefs having been submitted and considered, the District Court issued its conclusions of law. The District Court found Microsoft liable on the § 1 tying and § 2 monopoly maintenance and attempted monopolization claims, *Conclusions of Law*, at 35–51, while ruling that there was insufficient evidence to support a § 1 exclusive dealing violation, *id.* at 51–54. As to the pendent State actions, the District Court found the State antitrust laws conterminous with §§ 1 and 2 of the Sherman Act, thereby obviating the need for further State-specific analysis. *Id.* at 54–56. In those few cases where a State's law required an additional showing of *intrastate* impact on competition, the District Court found the requirement easily satisfied on the evidence at hand. *Id.* at 55.

Having found Microsoft liable on all but one count, the District Court then asked plaintiffs to submit a proposed remedy. Plaintiffs' proposal for a remedial order was subsequently filed within four weeks, along with six supplemental declarations and over 50 new exhibits. In their proposal, plaintiffs sought specific conduct remedies, plus structural relief that would split Microsoft into an applications company and an operating systems company. The District Court rejected Microsoft's request for further evidentiary proceedings and, following a single hearing on the merits of the remedy question, issued its Final Judgment on June 7, 2000. The District Court adopted plaintiffs' proposed remedy without substantive change.

Microsoft filed a notice of appeal within a week after the District Court issued its Final Judgment. This court then ordered that any proceedings before it be heard by the court sitting *en banc*. Before any substantive matters were addressed by this court, however, the District Court certified appeal of the case brought by the United States directly to the Supreme Court pursuant to 15 U.S.C. § 29(b), while staying the final judgment order in the federal and state cases pending appeal. The States thereafter petitioned the Supreme Court for a *writ of certiorari* in their case. The Supreme Court declined to hear the appeal of the Government's case and remanded the matter to this court; the Court likewise denied the States' petition for *writ of certiorari*. *Microsoft Corp. v. United States*, 530 U.S. 1301 (2000). This consolidated appeal followed.

B. Overview

Before turning to the merits of Microsoft's various arguments, we pause to reflect briefly on two matters of note, one practical and one theoretical.

The practical matter relates to the temporal dimension of this case. The litigation timeline in this case is hardly problematic. Indeed, it is noteworthy that a case of this magnitude and complexity has proceeded from the filing of complaints through trial to appellate decision in a mere three years. *See, e.g., Data Gen. Corp. v. Grumman Sys. Support Corp.*, 36 F.3d 1147, 1155 (1st Cir. 1994) (six years from filing of complaint to appellate decision); *Transamerica Computer Co., Inc. v. IBM*, 698 F.2d 1377, 1381 (9th Cir. 1983) (over four years from start of trial to appellate decision); *United States v. United Shoe Mach. Corp.*, 110 F. Supp. 295, 298 (D. Mass. 1953) (over five years from filing of complaint to trial court decision).

What is somewhat problematic, however, is that just over six years have passed since Microsoft engaged in the first conduct plaintiffs allege to be anticompetitive. As the record in this case indicates, six years seems like an eternity in the computer industry. By the time a court can assess liability, firms, products, and the marketplace are likely to have changed dramatically. This, in turn, threatens enormous practical difficulties for courts considering the appropriate measure of relief in equitable enforcement actions, both in crafting injunctive remedies in the first instance and reviewing those remedies in the second. Conduct remedies may be unavailing in such cases, because innovation to a large degree has already rendered the anticompetitive conduct obsolete (although by no means harmless). And broader structural remedies present their own set of problems, including how a court goes about *restoring* competition to a dramatically changed, and constantly changing, marketplace. That is just one reason why we find the District Court's refusal in the present case to hold an evidentiary hearing on remedies—to update and flesh out the available information before seriously entertaining the possibility of dramatic structural relief—so problematic. *See infra* Section V.

We do not mean to say that enforcement actions will no longer play an important role in curbing infringements of the antitrust laws in technologically dynamic markets, nor do we assume this in assessing the merits of this case. Even in those cases where forward-looking remedies appear limited, the Government will continue to have an interest in defining the contours of the antitrust laws so that law-abiding firms will have a clear sense of what is permissible and what is not. And the threat of private damage actions will remain to deter those firms inclined to test the limits of the law.

The second matter of note is more theoretical in nature. We decide this case against a backdrop of significant debate amongst academics and practitioners over the extent to which "old economy" § 2 monopolization doctrines should apply to firms competing in dynamic technological markets characterized by network effects. In markets characterized by network effects, one product or standard tends towards dominance, because "the utility that a user derives from consumption of the good increases with the number of other agents consuming the good." Michael L. Katz & Carl Shapiro, *Network Externalities, Competition, and Compatibility*, 75 AM. ECON. REV. 424, 424 (1985). For example, "[a]n individual consumer's demand to use (and hence her benefit from) the telephone network . . . increases with the number of other users on the network whom she can call or from whom she can receive calls." Howard A. Shelanski & J. Gregory Sidak, *Antitrust Divestiture in Network Industries*, 68 U. CHI. L. REV. 1, 8 (2001). Once a product or standard achieves wide acceptance, it becomes more or less entrenched. Competition in such industries is "for the field" rather than "within the field." *See* Harold Demsetz, *Why Regulate Utilities*?, 11 J.L. & ECON. 55, 57 & n.7 (1968) (emphasis omitted).

In technologically dynamic markets, however, such entrenchment may be temporary, because innovation may alter the field altogether. *See* JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM AND DEMOCRACY 81–90 (Harper Perennial 1976) (1942). Rapid technological change leads to markets in which "firms compete through innovation for temporary market dominance, from which they may be displaced by the next wave of product advancements." Shelanski & Sidak, at 11–12 (discussing Schumpeterian competition, which proceeds "sequentially over time rather than simultaneously across a market"). Microsoft argues that the operating system market is just such a market.

Whether or not Microsoft's characterization of the operating system market is correct does not appreciably alter our mission in assessing the alleged antitrust violations in the present case. As an initial matter, we note that there is no consensus among commentators on the question of whether, and to what extent, current monopolization doctrine should be amended to account for competition in technologically dynamic markets characterized by network effects. *Compare* Steven C. Salop & R. Craig Romaine, *Preserving Monopoly: Economic Analysis, Legal Standards, and Microsoft*, 7 GEO. MASON L. REV. 617, 654–55, 663–64 (1999) (arguing that exclusionary conduct in high-tech networked industries deserves heightened antitrust scrutiny in part because it may threaten to deter innovation), *with* Ronald A. Cass & Keith N. Hylton, *Preserving Competition: Economic Analysis, Legal Standards and Microsoft*, 8 GEO. MASON L. REV. 1, 36–39 (1999) (equivocating on the antitrust implications of network effects and noting that the presence of network externalities may actually encourage innovation by guaranteeing more durable monopolies to innovating winners). Indeed, there is some suggestion that the economic consequences of network effects and technological dynamism act to offset one another, thereby making it difficult to formulate categorical antitrust rules absent a particularized analysis of a given market. *See* Shelanski & Sidak, at 6–7 ("High profit margins might appear to be the benign and necessary recovery of legitimate investment returns in a Schumpeterian framework, but they might represent exploitation of customer lock-in and monopoly power when viewed through the lens of network economics. . . . The issue is particularly complex because, in network industries characterized by rapid innovation, both forces may be operating and can be difficult to isolate.").

Moreover, it should be clear that Microsoft makes no claim that anticompetitive conduct should be assessed differently in technologically dynamic markets. It claims only that the measure of monopoly power should be different. For reasons fully discussed below, we reject Microsoft's monopoly power argument. *See infra* Section II.A.

With this backdrop in mind, we turn to the specific challenges raised in Microsoft's appeal.

II. MONOPOLIZATION

Section 2 of the Sherman Act makes it unlawful for a firm to "monopolize." 15 U.S.C. § 2. The offense of monopolization has two elements: "(1) the possession of monopoly power in the relevant market and (2) the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident." *United States v. Grinnell Corp.*, 384 U.S. 563, 570–71 (1966). The District Court applied this test and found that Microsoft possesses monopoly power in the market for Intel-compatible PC operating systems. Focusing primarily on Microsoft's efforts to suppress Netscape Navigator's threat to its operating system monopoly, the court also found that Microsoft maintained its power not through competition on the merits, but through unlawful means. Microsoft challenges both conclusions. We defer to the District Court's findings of fact, setting them aside only if clearly erroneous. FED R. CIV. P. 52(a). We review legal questions *de novo*. *United States ex rel. Modern Elec., Inc. v. Ideal Elec. Sec. Co.*, 81 F.3d 240, 244 (D.C. Cir. 1996).

We begin by considering whether Microsoft possesses monopoly power, *see infra* Section II.A, and finding that it does, we turn to the question whether it maintained this power through anticompetitive means. Agreeing with the District Court that the company behaved anticompetitively, *see infra* Section II.B, and that these actions contributed to the maintenance of its monopoly power, *see infra* Section II.C, we affirm the court's finding of liability for monopolization.

A. Monopoly Power

While merely possessing monopoly power is not itself an antitrust violation, *see Northeastern Tel. Co. v. AT & T*, 651 F.2d 76, 84–85 (2d Cir. 1981), it is a necessary element of a monopolization charge, *see Grinnell*, 384 U.S. at 570. The Supreme Court defines monopoly power as "the power to control prices or exclude competition." *United States v. E.I. du Pont de Nemours & Co.*, 351 U.S. 377, 391 (1956). More precisely, a firm is a monopolist if it can profitably raise prices substantially above the competitive level. 2A PHILLIP E. AREEDA ET AL., ANTITRUST LAW ¶ 501, at 85 (1995); *cf. Ball Mem'l Hosp., Inc. v. Mut. Hosp. Ins., Inc.*, 784 F.2d 1325, 1335 (7th Cir. 1986) (defining market power as "the ability to cut back the market's total output and so raise price"). Where evidence indicates that a firm has in fact profitably done so, the existence of monopoly power is clear. *See Rebel Oil Co. v. Atl. Richfield Co.*, 51 F.3d 1421, 1434 (9th Cir. 1995); *see also FTC v. Indiana Fed'n of Dentists*, 476 U.S. 447, 460–61 (1986) (using direct proof to show market power in Sherman Act § 1 unreasonable restraint of trade action). Because such direct proof is only rarely available, courts more typically examine market structure in search of circumstantial evidence of monopoly power. 2A AREEDA ET AL., ANTITRUST LAW ¶ 531a, at 156; *see also, e.g.*, *Grinnell*, 384 U.S. at 571. Under this structural approach, monopoly power may be inferred from a firm's possession of a dominant share of a relevant market that is protected by entry barriers. *See*

Rebel Oil, 51 F.3d at 1434. "Entry barriers" are factors (such as certain regulatory requirements) that prevent new rivals from timely responding to an increase in price above the competitive level. *See S. Pac. Communications Co. v. AT & T*, 740 F.2d 980, 1001–02 (D.C. Cir. 1984).

The District Court considered these structural factors and concluded that Microsoft possesses monopoly power in a relevant market. Defining the market as Intel-compatible PC operating systems, the District Court found that Microsoft has a greater than 95% share. It also found the company's market position protected by a substantial entry barrier. *Conclusions of Law*, at 36.

Microsoft argues that the District Court incorrectly defined the relevant market. It also claims that there is no barrier to entry in that market. Alternatively, Microsoft argues that because the software industry is uniquely dynamic, direct proof, rather than circumstantial evidence, more appropriately indicates whether it possesses monopoly power. Rejecting each argument, we uphold the District Court's finding of monopoly power in its entirety.

1. Market Structure

a. *Market definition*

"Because the ability of consumers to turn to other suppliers restrains a firm from raising prices above the competitive level," *Rothery Storage & Van Co. v. Atlas Van Lines, Inc.*, 792 F.2d 210, 218 (D.C. Cir. 1986), the relevant market must include all products "reasonably interchangeable by consumers for the same purposes." *du Pont*, 351 U.S. at 395. In this case, the District Court defined the market as "the licensing of all Intel-compatible PC operating systems worldwide," finding that there are "currently no products—and . . . there are not likely to be any in the near future—that a significant percentage of computer users worldwide could substitute for [these operating systems] without incurring substantial costs." *Conclusions of Law*, at 36. Calling this market definition "far too narrow," Appellant's Opening Br. at 84, Microsoft argues that the District Court improperly excluded three types of products: non-Intel compatible operating systems (primarily Apple's Macintosh operating system, Mac OS), operating systems for non-PC devices (such as handheld computers and portal websites), and "middleware" products, which are not operating systems at all.

We begin with Mac OS. Microsoft's argument that Mac OS should have been included in the relevant market suffers from a flaw that infects many of the company's monopoly power claims: the company fails to challenge the District Court's factual findings, or to argue that these findings do not support the court's conclusions. The District Court found that consumers would not switch from Windows to Mac OS in response to a substantial price increase because of the costs of acquiring the new hardware needed to run Mac OS (an Apple computer and peripherals) and compatible software applications, as well as because of the effort involved in learning the new system and transferring files to its format. *Findings of Fact* ¶ 20. The court also found the Apple system less appealing to consumers because it costs considerably more and supports fewer applications. *Id.* ¶ 21. Microsoft responds only by saying: "the district court's market definition is so narrow that it excludes Apple's Mac OS, which has competed with Windows for years, simply because the Mac OS runs on a different microprocessor." Appellant's Opening Br. at 84. This general, conclusory statement falls far short of what is required to challenge findings as clearly erroneous. *Pendleton v. Rumsfeld*, 628 F.2d 102, 106 (D.C. Cir. 1980); *see also Terry v. Reno*, 101 F.3d 1412, 1415 (D.C. Cir. 1996) (holding that claims made but not argued in a brief are waived). Microsoft neither points to evidence contradicting the District Court's findings nor alleges that supporting record evidence is insufficient. And since Microsoft does not argue that even if we accept these findings, they do not support the District Court's conclusion, we have no basis for upsetting the court's decision to exclude Mac OS from the relevant market.

Microsoft's challenge to the District Court's exclusion of non-PC based competitors, such as information appliances (handheld devices, etc.) and portal websites that host server-based software applications, suffers from the same defect:

the company fails to challenge the District Court's key factual findings. In particular, the District Court found that because information appliances fall far short of performing all of the functions of a PC, most consumers will buy them only as a supplement to their PCs. *Findings of Fact* ¶ 23. The District Court also found that portal websites do not presently host enough applications to induce consumers to switch, nor are they likely to do so in the near future. *Id.* ¶ 27. Again, because Microsoft does not argue that the District Court's findings do not support its conclusion that information appliances and portal websites are outside the relevant market, we adhere to that conclusion.

This brings us to Microsoft's main challenge to the District Court's market definition: the exclusion of middleware. Because of the importance of middleware to this case, we pause to explain what it is and how it relates to the issue before us.

Operating systems perform many functions, including allocating computer memory and controlling peripherals such as printers and keyboards. *See* Direct Testimony of Frederick Warren–Boulton ¶ 20, *reprinted in* 5 J.A. at 3172–73. Operating systems also function as platforms for software applications. They do this by "exposing"—*i.e.*, making available to software developers—routines or protocols that perform certain widely-used functions. These are known as Application Programming Interfaces, or "APIs." *See* Direct Testimony of James Barksdale ¶ 70, *reprinted in* 5 J.A. at 2895–96. For example, Windows contains an API that enables users to draw a box on the screen. *See* Direct Testimony of Michael T. Devlin ¶ 12, *reprinted in* 5 J.A. at 3525. Software developers wishing to include that function in an application need not duplicate it in their own code. Instead, they can "call"—*i.e.*, use—the Windows API. *See* Direct Testimony of James Barksdale ¶ ¶ 70–71, *reprinted in* 5 J.A. at 2895–97. Windows contains thousands of APIs, controlling everything from data storage to font display. *See* Direct Testimony of Michael Devlin ¶ 12, *reprinted in* 5 J.A. at 3525.

Every operating system has different APIs. Accordingly, a developer who writes an application for one operating system and wishes to sell the application to users of another must modify, or "port," the application to the second operating system. *Findings of Fact* ¶ 4. This process is both time-consuming and expensive. *Id.* ¶ 30.

"Middleware" refers to software products that expose their own APIs. *Id.* ¶ 28; Direct Testimony of Paul Maritz ¶ ¶ 234–36, *reprinted in* 6 J.A. at 3727–29. Because of this, a middleware product written for Windows could take over some or all of Windows's valuable platform functions—that is, developers might begin to rely upon APIs exposed by the middleware for basic routines rather than relying upon the API set included in Windows. If middleware were written for multiple operating systems, its impact could be even greater. The more developers could rely upon APIs exposed by such middleware, the less expensive porting to different operating systems would be. Ultimately, if developers could write applications relying exclusively on APIs exposed by middleware, their applications would run on any operating system on which the middleware was also present. *See* Direct Testimony of Avadis Tevanian, Jr. ¶ 45, *reprinted in* 5 J.A. at 3113. Netscape Navigator and Java—both at issue in this case—are middleware products written for multiple operating systems. *Findings of Fact* ¶ 28.

Microsoft argues that, because middleware could usurp the operating system's platform function and might eventually take over other operating system functions (for instance, by controlling peripherals), the District Court erred in excluding Navigator and Java from the relevant market. The District Court found, however, that neither Navigator, Java, nor any other middleware product could now, or would soon, expose enough APIs to serve as a platform for popular applications, much less take over all operating system functions. *Id.* ¶ ¶ 28–29. Again, Microsoft fails to challenge these findings, instead simply asserting middleware's "potential" as a competitor. Appellant's Opening Br. at 86. The test of reasonable interchangeability, however, required the District Court to consider only substitutes that constrain pricing in the reasonably foreseeable future, and only products that can enter the market in a relatively short time can perform this function. *See Rothery*, 792 F.2d at 218 ("Because the ability of consumers to turn to other suppliers restrains a firm from raising prices above the competitive level, the definition of the 'relevant market' rests on a determination of available substitutes."); *see also Findings of Fact* ¶ 29 ("[I]t would take several years for middleware . . . to evolve" into a product that can constrain operating system pricing.). Whatever middleware's ultimate potential, the District Court found that consumers could not now abandon their operating systems and switch to middleware in response to a sustained price for Windows above the competative level. *Findings of Fact* ¶ ¶ 28, 29. Nor is middleware likely to overtake the operating system as the primary platform for software development any time in the near future. *Id.*

Alternatively, Microsoft argues that the District Court should not have excluded middleware from the relevant market because the primary focus of the plaintiffs' § 2 charge is on Microsoft's attempts to suppress middleware's threat to its operating system monopoly. According to Microsoft, it is "contradict[ory]," 2/26/2001 Ct. Appeals Tr. at 20, to define the relevant market to exclude the "very competitive threats that gave rise" to the action. Appellant's Opening Br. at 84. The purported contradiction lies between plaintiffs' § 2 theory, under which Microsoft preserved its monopoly against middleware technologies that threatened to become viable substitutes for Windows, and its theory of the relevant market, under which middleware is not presently a viable substitute for Windows. Because middleware's threat is only nascent, however, no contradiction exists. Nothing in § 2 of the Sherman Act limits its prohibition to actions taken against threats that are already well-developed enough to serve as present substitutes. *See infra* Section II.C. Because market definition is meant to identify products "reasonably interchangeable by consumers," *du Pont*, 351 U.S. at 395, and because middleware is not now interchangeable with Windows, the District Court had good reason for excluding middleware from the relevant market.

b. *Market power*

Having thus properly defined the relevant market, the District Court found that Windows accounts for a greater than 95% share. *Findings of Fact* ¶ 35. The court also found that even if Mac OS were included, Microsoft's share would exceed 80%. *Id.* Microsoft challenges neither finding, nor does it argue that such a market share is not predominant. *Cf. Grinnell*, 384 U.S. at 571 (87% is predominant); *Eastman Kodak Co. v. Image Technical Servs., Inc.*, 504 U.S. 451, 481 (1992) (80%); *du Pont*, 351 U.S. at 379, 391 (75%).

Instead, Microsoft claims that even a predominant market share does not by itself indicate monopoly power. Although the "existence of [monopoly] power ordinarily may be inferred from the predominant share of the market," *Grinnell*, 384 U.S. at 571, we agree with Microsoft that because of the possibility of competition from new entrants, *see Ball Mem'l Hosp., Inc.*, 784 F.2d at 1336, looking to current market share alone can be "misleading." *Hunt-Wesson Foods, Inc. v. Ragu Foods, Inc.*, 627 F.2d 919, 924 (9th Cir. 1980); *see also Ball Mem'l Hosp., Inc.*, 784 F.2d at 1336 ("Market share reflects current sales, but today's sales do not always indicate power over sales and price tomorrow.") In this case, however, the District Court was not misled. Considering the possibility of new rivals, the court focused not only on Microsoft's present market share, but also on the structural barrier that protects the company's future position. *Conclusions of Law*, at 36. That barrier—the "applications barrier to entry"—stems from two characteristics of the software market: (1) most consumers prefer operating systems for which a large number of applications have already been written; and (2) most developers prefer to write for operating systems that already have a substantial consumer base. *See Findings of Fact* ¶¶ 30, 36. This "chicken-and-egg" situation ensures that applications will continue to be written for the already dominant Windows, which in turn ensures that consumers will continue to prefer it over other operating systems. *Id.*

Challenging the existence of the applications barrier to entry, Microsoft observes that software developers do write applications for other operating systems, pointing out that at its peak IBM's OS/2 supported approximately 2,500 applications. *Id.* ¶ 46. This misses the point. That some developers write applications for other operating systems is not at all inconsistent with the finding that the applications barrier to entry discourages many from writing for these less popular platforms. Indeed, the District Court found that IBM's difficulty in attracting a larger number of software developers to write for its platform seriously impeded OS/2's success. *Id.* ¶ 46.

Microsoft does not dispute that Windows supports many more applications than any other operating system. It argues instead that "[i]t defies common sense" to suggest that an operating system must support as many applications as Windows does (more than 70,000, according to the District Court, *id.* ¶ 40) to be competitive. Appellant's Opening Br. at 96. Consumers, Microsoft points out, can only use a very small percentage of these applications. *Id.* As the District Court explained, however, the applications barrier to entry gives consumers reason to prefer the dominant operating system even if they have no need to use all applications written for it:

> The consumer wants an operating system that runs not only types of applications that he knows he will want to use, but also those types in which he might develop an interest later. Also, the consumer knows that if he chooses an operating system with enough demand to support multiple applications in each product category, he will be less likely to find himself straitened later by having to use an application whose features disappoint him. Finally, the average user knows that, generally speaking, applications improve through successive versions. He thus wants an operating system for which successive generations of his favorite applications will be released—promptly at that. The fact that a vastly larger number of applications are written for Windows than for other PC operating systems attracts consumers to Windows, because it reassures them that their interests will be met as long as they use Microsoft's product.

Findings of Fact ¶ 37. Thus, despite the limited success of its rivals, Microsoft benefits from the applications barrier to entry.

Of course, were middleware to succeed, it would erode the applications barrier to entry. Because applications written for multiple operating systems could run on any operating system on which the middleware product was present with little, if any, porting, the operating system market would become competitive. *Id.* ¶ ¶ 29, 72. But as the District Court found, middleware will not expose a sufficient number of APIs to erode the applications barrier to entry in the foreseeable future. *See id.* ¶ ¶ 28–29.

Microsoft next argues that the applications barrier to entry is not an entry barrier at all, but a reflection of Windows' popularity. It is certainly true that Windows may have gained its initial dominance in the operating system market competitively—through superior foresight or quality. But this case is not about Microsoft's initial acquisition of monopoly power. It is about Microsoft's efforts to maintain this position through means other than competition on the merits. Because the applications barrier to entry protects a dominant operating system irrespective of quality, it gives Microsoft power to stave off even superior new rivals. The barrier is thus a characteristic of the operating system market, not of Microsoft's popularity, or, as asserted by a Microsoft witness, the company's efficiency. *See* Direct Testimony of Richard Schmalensee ¶ 115, *reprinted in* 25 J.A. at 16153–14.

Finally, Microsoft argues that the District Court should not have considered the applications barrier to entry because it reflects not a cost borne disproportionately by new entrants, but one borne by all participants in the operating system market. According to Microsoft, it had to make major investments to convince software developers to write for its new operating system, and it continues to "evangelize" the Windows platform today. Whether costs borne by all market participants should be considered entry barriers is the subject of much debate. C*ompare* 2A AREEDA & HOVENKAMP, ANTITRUST LAW § 420c, at 61 (arguing that these costs are entry barriers), *and* JOE S. BAIN, BARRIERS TO NEW COMPETITION: THEIR CHARACTER AND CONSEQUENCES IN MANUFACTURING INDUSTRIES 6–7 (1956) (considering these costs entry barriers), *with L.A. Land Co. v. Brunswick Corp.*, 6 F.3d 1422, 1428 (9th Cir. 1993) (evaluating cost based on "[t]he disadvantage of new entrants as compared to incumbents"), *and* GEORGE STIGLER, THE ORGANIZATION OF INDUSTRY 67 (1968) (excluding these costs). We need not resolve this issue, however, for even under the more narrow definition it is clear that there are barriers. When Microsoft entered the operating system market with MS–DOS and the first version of Windows, it did not confront a dominant rival operating system with as massive an installed base and as vast an existing array of applications as the Windows operating systems have since enjoyed. *Findings of Fact* ¶ ¶ 6, 7, 43. Moreover, when Microsoft introduced Windows 95 and 98, it was able to bypass the applications barrier to entry that protected the incumbent Windows by including APIs from the earlier version in the new operating systems. *See id.* ¶ 44. This made porting existing Windows applications to the new version of Windows much less costly than porting them to the operating systems of other entrants who could not freely include APIs from the incumbent Windows with their own.

2. Direct Proof

Having sustained the District Court's conclusion that circumstantial evidence proves that Microsoft possesses monopoly power, we turn to Microsoft's alternative argument that it does not behave like a monopolist. Claiming that software competition is uniquely "dynamic," Appellant's Opening Br. at 84 (quoting *Findings of Fact* ¶ 59), the company suggests a new rule: that monopoly power in the software industry should be proven directly, that is, by examining a company's actual behavior to determine if it reveals the existence of monopoly power. According to Microsoft, not only does no such proof of its power exist, but record evidence demonstrates the absence of monopoly power. The company claims that it invests heavily in research and development, *id.* at 88–89 (citing Direct Testimony of Paul Maritz ¶ 155, *reprinted in* 6 J.A. at 3698 (testifying that Microsoft invests approximately 17% of its revenue in R&D)), and charges a low price for Windows (a small percentage of the price of an Intel-compatible PC system and less than the price of its rivals, *id.* at 90 (citing *Findings of Fact* ¶ ¶ 19, 21, 46)).

Microsoft's argument fails because, even assuming that the software market is uniquely dynamic in the long term, the District Court correctly applied the structural approach to determine if the company faces competition in the short term.

Structural market power analyses are meant to determine whether potential substitutes constrain a firm's ability to raise prices above the competitive level; only threats that are likely to materialize in the relatively near future perform this function to any significant degree. *Rothery*, 792 F.2d at 218 (quoting LAWRENCE SULLIVAN, ANTITRUST § 12, at 41 (1977)) (only substitutes that can enter the market "promptly" should be considered). The District Court expressly considered and rejected Microsoft's claims that innovations such as handheld devices and portal websites would soon expand the relevant market beyond Intel-compatible PC operating systems. Because the company does not challenge these findings, we have no reason to believe that prompt substitutes are available. The structural approach, as applied by the District Court, is thus capable of fulfilling its purpose even in a changing market. Microsoft cites no case, nor are we aware of one, requiring direct evidence to show monopoly power in any market. We decline to adopt such a rule now.

Even if we were to require direct proof, moreover, Microsoft's behavior may well be sufficient to show the existence of monopoly power. Certainly, none of the conduct Microsoft points to—its investment in R&D and the relatively low price of Windows—is inconsistent with the possession of such power. *Conclusions of Law*, at 37. The R&D expenditures Microsoft points to are not simply for Windows, but for its entire company, which most likely does not possess a monopoly for all of its products. Moreover, because innovation can increase an already dominant market share and further delay the emergence of competition, even monopolists have reason to invest in R&D. *Findings of Fact* ¶ 61. Microsoft's pricing behavior is similarly equivocal. The company claims only that it never charged the short-term profit-maximizing price for Windows. Faced with conflicting expert testimony, the District Court found that it could not accurately determine what this price would be. *Id.* ¶ 65. In any event, the court found, a price lower than the short-term profit-maximizing price is not inconsistent with possession or improper use of monopoly power. *Id.* ¶ ¶ 65–66. *Cf. Berkey Photo, Inc. v.*

Eastman Kodak Co., 603 F.2d 263, 274 (2d Cir. 1979) ("[I]f monopoly power has been acquired or maintained through improper means, the fact that the power has not been used to extract [a monopoly price] provides no succor to the monopolist."). Microsoft never claims that it did not charge the long-term monopoly price. Micosoft does argue that the price of Windows is a fraction of the price of an Intel-compatible PC system and lower than that of rival operating systems, but these facts are not inconsistent with the District Court's finding that Microsoft has monopoly power. *See Findings of Fact* ¶ 36 ("Intel-compatible PC operating systems other than Windows [would not] attract[ ] significant demand . . . even if Micosoft held its prices substantially above the competitive level.").

More telling, the District Court found that some aspects of Microsoft's behavior are difficult to explain unless Windows is a monopoly product. For instance, according to the District Court, the company set the price of Windows without considering rivals' prices, *Findings of Fact* ¶ 62, something a firm without a monopoly would have been unable to do. The District Court also found that Microsoft's pattern of exclusionary conduct could only be rational "if the firm knew that it possessed monopoly power." *Conclusions of Law*, at 37. It is to that conduct that we now turn.

B. Anticompetitive Conduct

As discussed above, having a monopoly does not by itself violate § 2. A firm violates § 2 only when it acquires or maintains, or attempts to acquire or maintain, a monopoly by engaging in exclusionary conduct "as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident." *Grinnell*, 384 U.S. at 571; *see also United States v. Aluminum Co. of Am.*, 148 F.2d 416, 430 (2d Cir. 1945) (Hand, J.) ("The successful competitor, having been urged to compete, must not be turned upon when he wins.").

In this case, after concluding that Microsoft had monopoly power, the District Court held that Microsoft had violated § 2 by engaging in a variety of exclusionary acts (not including predatory pricing), to maintain its monopoly by preventing the effective distribution and use of products that might threaten that monopoly. Specifically, the District Court held Microsoft liable for: (1) the way in which it integrated IE into

Windows; (2) its various dealings with Original Equipment Manufacturers ("OEMs"), Internet Access Providers ("IAPs"), Internet Content Providers ("ICPs"), Independent Software Vendors ("ISVs"), and Apple Computer; (3) its efforts to contain and to subvert Java technologies; and (4) its course of conduct as a whole. Upon appeal, Microsoft argues that it did not engage in any exclusionary conduct.

Whether any particular act of a monopolist is exclusionary, rather than merely a form of vigorous competition, can be difficult to discern: the means of illicit exclusion, like the means of legitimate competition, are myriad. The challenge for an antitrust court lies in stating a general rule for distinguishing between exclusionary acts, which reduce social welfare, and competitive acts, which increase it.

From a century of case law on monopolization under § 2, however, several principles do emerge. First, to be condemned as exclusionary, a monopolist's act must have an "anticompetitive effect." That is, it must harm the competitive *process* and thereby harm consumers. In contrast, harm to one or more *competitors* will not suffice. "The [Sherman Act] directs itself not against conduct which is competitive, even severely so, but against conduct which unfairly tends to destroy competition itself." *Spectrum Sports, Inc. v. McQuillan*, 506 U.S. 447, 458 (1993); *see also Brooke Group Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209, 225 (1993) ("Even an act of pure malice by one business competitor against another does not, without more, state a claim under the federal antitrust laws . . . .").

Second, the plaintiff, on whom the burden of proof of course rests, *see, e.g., Monsanto Co. v. Spray–Rite Serv. Corp.*, 465 U.S. 752, 763 (1984); *see also United States v. Arnold, Schwinn & Co.*, 388 U.S. 365, 374 n.5 (1967), *overruled on other grounds*, *Cont'l T.V., Inc. v. GTE Sylvania Inc.*, 433 U.S. 36 (1977), must demonstrate that the monopolist's conduct indeed has the requisite anticompetitive effect. *See generally Brooke Group*, 509 U.S. at 225–26. In a case brought by a private plaintiff, the plaintiff must show that its injury is "of 'the type that the statute was intended to forestall,' " *Brunswick Corp. v. Pueblo Bowl–O–Mat, Inc.*, 429 U.S. 477, 487–88 (1977) (quoting *Wyandotte Transp. v. United States*, 389 U.S. 191, 202 (1967)); no less in a case brought by the Government, it must demonstrate that the monopolist's conduct harmed competition, not just a competitor.

Third, if a plaintiff successfully establishes a *prima facie* case under § 2 by demonstrating anticompetitive effect, then the monopolist may proffer a "procompetitive justification" for its conduct. *See Eastman Kodak,* 504 U.S. at 483. If the monopolist asserts a procompetitive justification—a nonpretextual claim that its conduct is indeed a form of competition on the merits because it involves, for example, greater efficiency or enhanced consumer appeal—then the burden shifts back to the plaintiff to rebut that claim. *Cf. Capital Imaging Assocs., P.C. v. Mohawk Valley Med. Assocs., Inc.*, 996 F.2d 537, 543 (2d Cir. 1993).

Fourth, if the monopolist's procompetitive justification stands unrebutted, then the plaintiff must demonstrate that the anticompetitive harm of the conduct outweighs the procompetitive benefit. In cases arising under § 1 of the Sherman Act, the courts routinely apply a similar balancing approach under the rubric of the "rule of reason." The source of the rule of reason is *Standard Oil Co. v. United States*, 221 U.S. 1 (1911), in which the Supreme Court used that term to describe the proper inquiry under both sections of the Act. *See id.* at 61–62 ("[W]hen the second section [of the Sherman Act] is thus harmonized with ... the first, it becomes obvious that the criteria to be resorted to in any given case for the purpose of ascertaining whether violations of the section have been committed, is the rule of reason guided by the established law...."). As the Fifth Circuit more recently explained, "[i]t is clear ... that the analysis under section 2 is similar to that under section 1 regardless whether the rule of reason label is applied...." *Mid-Texas Communications Sys., Inc. v. AT & T*, 615 F.2d 1372, 1389 n.13 (5th Cir. 1980) (citing *Byars v. Bluff City News Co.*, 609 F.2d 843, 860 (6th Cir. 1979)); *see also Cal. Computer Prods., Inc. v. IBM Corp.*, 613 F.2d 727, 737 (9th Cir. 1979).

Finally, in considering whether the monopolist's conduct on balance harms competition and is therefore condemned as exclusionary for purposes of § 2, our focus is upon the effect of that conduct, not upon the intent behind it. Evidence of the intent behind the conduct of a monopolist is relevant only to the extent it helps us understand the likely effect of the monopolist's conduct. *See, e.g., Chicago Bd. of Trade v. United States*, 246 U.S. 231, 238 (1918) ("knowledge of intent may help the court to interpret facts and to predict consequences"); *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.,* 472 U.S. 585, 603 (1985).

With these principles in mind, we now consider Microsoft's objections to the District Court's holding that Microsoft violated § 2 of the Sherman Act in a variety of ways.

1. Licenses Issued to Original Equipment Manufacturers

The District Court condemned a number of provisions in Microsoft's agreements licensing Windows to OEMs, because it found that Microsoft's imposition of those provisions (like many of Microsoft's other actions at issue in this case) serves to reduce usage share of Netscape's browser and, hence, protect Microsoft's operating system monopoly. The reason market share in the browser market affects market power in the operating system market is complex, and warrants some explanation.

Browser usage share is important because, as we explained in Section II.A above, a browser (or any middleware product, for that matter) must have a critical mass of users in order to attract software developers to write applications relying upon the APIs it exposes, and away from the APIs exposed by Windows. Applications written to a particular browser's APIs, however, would run on any computer with that browser, regardless of the underlying operating system. "The overwhelming majority of consumers will only use a PC operating system for which there already exists a large and varied set of . . . applications, and for which it seems relatively certain that new types of applications and new versions of existing applications will continue to be marketed. . . ."

Findings of Fact ¶ 30. If a consumer could have access to the applications he desired—regardless of the operating system he uses—simply by installing a particular browser on his computer, then he would no longer feel compelled to select Windows in order to have access to those applications; he could select an operating system other than Windows based solely upon its quality and price. In other words, the market for operating systems would be competitive.

Therefore, Microsoft's efforts to gain market share in one market (browsers) served to meet the threat to Microsoft's monopoly in another market (operating systems) by keeping rival browsers from gaining the critical mass of users necessary to attract developer attention away from Windows as the platform for software development. Plaintiffs also argue that Microsoft's actions injured competition in the browser market—an argument we will examine below in relation to their specific claims that Microsoft attempted to monopolize the browser market and unlawfully tied its browser to its operating system so as to foreclose competition in the browser market. In evaluating the § 2 monopoly maintenance claim, however, our immediate concern is with the anticompetitive effect of Microsoft's conduct in preserving its monopoly in the operating system market.

In evaluating the restrictions in Microsoft's agreements licensing Windows to OEMs, we first consider whether plaintiffs have made out a *prima facie* case by demonstrating that the restrictions have an anticompetitive effect. In the next subsection, we conclude that plaintiffs have met this burden as to all the restrictions. We then consider Microsoft's proffered justifications for the restrictions and, for the most part, hold those justifications insufficient.

a. Anticompetitive effect of the license restrictions

The restrictions Microsoft places upon Original Equipment Manufacturers are of particular importance in determining browser usage share because having an OEM pre-install a browser on a computer is one of the two most cost-effective methods by far of distributing browsing software. (The other is bundling the browser with internet access software distributed by an IAP.) *Findings of Fact* ¶ 145. The District Court found that the restrictions Microsoft imposed in licensing Windows to OEMs prevented many OEMs from distributing browsers other than IE. *Conclusions of Law,* at 39–40. In particular, the District Court condemned the license provisions prohibiting the OEMs from: (1) removing any desktop icons, folders, or "Start" menu entries; (2) altering the initial boot sequence; and (3) otherwise altering the appearance of the Windows desktop. *Findings of Fact* ¶ 213.

The District Court concluded that the first license restriction—the prohibition upon the removal of desktop icons, folders, and Start menu entries—thwarts the distribution of a rival browser by preventing OEMs from removing visible means of user access to IE. *Id.* ¶ 203. The OEMs cannot practically install a second browser in addition to IE, the court found, in part because "[p]re-installing more than one product in a given category . . . can significantly increase an OEM's support costs, for the redundancy can lead to confusion among novice users." *Id.* ¶ 159; *see also id.* ¶ 217. That is, a certain number of novice computer users, seeing two browser icons, will wonder which to use when and will call the OEM's support line. Support calls are extremely expensive and, in the highly competitive original equipment market, firms have a strong incentive to minimize costs. *Id.* ¶ 210.

Microsoft denies the "consumer confusion" story; it observes that some OEMs do install multiple browsers and that executives from two OEMs that do so denied any knowledge of consumers being confused by multiple icons. *See* 11/5/98 pm Tr. at 41–42 (trial testimony of Avadis Tevanian of Apple), *reprinted in* 9 J.A. at 5493–94; 11/18/99 am Tr. at 69 (trial testimony of John Soyring of IBM), *reprinted in* 10 J.A. at 6222.

Other testimony, however, supports the District Court's finding that fear of such confusion deters many OEMs from pre-installing multiple browsers. *See, e.g.,* 01/13/99 pm Tr. at 614–15 (deposition of Microsoft's Gayle McClain played to the court) (explaining that redundancy of icons may be confusing to end users); 02/18/99 pm Tr. at 46–47 (trial testimony of

John Rose of Compaq), *reprinted in* 21 J.A. at 14237–38 (same); 11/17/98 am Tr. at 68 (deposition of John Kies of Packard Bell–NEC played to the court), *reprinted in* 9 J.A. at 6016 (same); 11/17/98 am Tr. at 67–72 (trial testimony of Glenn Weadock), *reprinted in* 9 J.A. at 6015–20 (same). Most telling, in presentations to OEMs, Microsoft itself represented that having only one icon in a particular category would be "less confusing for endusers." *See* Government's Trial Exhibit ("GX") 319 at MS98 0109453. Accordingly, we reject Microsoft's argument that we should vacate the District Court's Finding of Fact 159 as it relates to consumer confusion.

As noted above, the OEM channel is one of the two primary channels for distribution of browsers. By preventing OEMs from removing visible means of user access to IE, the license restriction prevents many OEMs from pre-installing a rival browser and, therefore, protects Microsoft's monopoly from the competition that middleware might otherwise present. Therefore, we conclude that the license restriction at issue is anticompetitive. We defer for the moment the question whether that anticompetitive effect is outweighed by Microsoft's proffered justifications.

The second license provision at issue prohibits OEMs from modifying the initial boot sequence—the process that occurs the first time a consumer turns on the computer. Prior to the imposition of that restriction, "among the programs that many OEMs inserted into the boot sequence were Internet sign-up procedures that encouraged users to choose from a list of IAPs assembled by the OEM." *Findings of Fact* ¶ 210. Microsoft's prohibition on any alteration of the boot sequence thus prevents OEMs from using that process to promote the services of IAPs, many of which—at least at the time Microsoft imposed the restriction—used Navigator rather than IE in their internet access software. *See id.* ¶ 212; GX 295, *reprinted in* 12 J.A. at 14533 (Upon learning of OEM practices including boot sequence modification, Microsoft's Chairman, Bill Gates, wrote: "Apparently a lot of OEMs are bundling non-Microsoft browsers and coming up with offerings together with [IAPs] that get displayed on their machines in a FAR more prominent way than MSN or our Internet browser."). Microsoft does not deny that the prohibition on modifying the boot sequence has the effect of decreasing competition against IE by preventing OEMs from promoting rivals' browsers. Because this prohibition has a substantial effect in protecting Microsoft's market power, and does so through a means other than competition on the merits, it is anticompetitive. Again the question whether the provision is nonetheless justified awaits later treatment.

Finally, Microsoft imposes several additional provisions that, like the prohibition on removal of icons, prevent OEMs from making various alterations to the desktop: Microsoft prohibits OEMs from causing any user interface other than the Windows desktop to launch automatically, from adding icons or folders different in size or shape from those supplied by Microsoft, and from using the "Active Desktop" feature to promote third-party brands. These restrictions impose significant costs upon the OEMs; prior to Microsoft's prohibiting the practice, many OEMs would change the appearance of the desktop in ways they found beneficial. *See, e.g., Findings of Fact* ¶ 214; GX 309, *reprinted in* 22 J.A. at 14551 (March 1997 letter from Hewlett–Packard to Microsoft: "We are responsible for the cost of technical support of our customers, including the 33% of calls we get related to the lack of quality or confusion generated by your product. . . . We must have more ability to decide how our system is presented to our end users. If we had a choice of another supplier, based on your actions in this area, I assure you [that you] would not be our supplier of choice.").

The dissatisfaction of the OEM customers does not, of course, mean the restrictions are anticompetitive. The anticompetitive effect of the license restrictions is, as Microsoft itself recognizes, that OEMs are not able to promote rival browsers, which keeps developers focused upon the APIs in Windows. *Findings of Fact* ¶ 212 (quoting Microsoft's Gates as writing, "[w]inning Internet browser share is a very very important goal for us," and emphasizing the need to prevent OEMs from promoting both rival browsers and IAPs that might use rivals' browsers); *see also* 01/13/99 Tr. at 305–06 (excerpts from deposition of James Von Holle of Gateway) (prior to restriction Gateway had pre-installed non-IE internet registration icon that was larger than other desktop icons). This kind of promotion is not a zero-sum game; but for the restrictions in their licenses to use Windows, OEMs could promote multiple IAPs and browsers. By preventing the OEMs from doing so, this type of license restriction, like the first two restrictions, is anticompetitive: Microsoft reduced rival browsers' usage share not by improving its own product but, rather, by preventing OEMs from taking actions that could increase rivals' share of usage.

b. *Microsoft's justifications for the license restrictions*

Microsoft argues that the license restrictions are legally justified because, in imposing them, Microsoft is simply "exercising its rights as the holder of valid copyrights." Appellant's Opening Br. at 102. Microsoft also argues that the licenses "do not unduly restrict the opportunities of Netscape to distribute Navigator in any event." *Id.*

Microsoft's primary copyright argument borders upon the frivolous. The company claims an absolute and unfettered right to use its intellectual property as it wishes: "[I]f intellectual property rights have been lawfully acquired," it says, then "their subsequent exercise cannot give rise to antitrust liability." Appellant's Opening Br. at 105. That is no more correct than the proposition that use of one's personal property, such as a baseball bat, cannot give rise to tort liability. As the Federal Circuit succinctly stated: "Intellectual property rights do not confer a privilege to violate the antitrust laws." *In re Indep. Serv. Orgs. Antitrust Litig.*, 203 F.3d 1322, 1325 (Fed. Cir. 2000).

Although Microsoft never overtly retreats from its bold and incorrect position on the law, it also makes two arguments to the effect that it is not exercising its copyright in an unreasonable manner, despite the anticompetitive consequences of the license restrictions discussed above. In the first variation upon its unqualified copyright defense, Microsoft cites two cases indicating that a copyright holder may limit a licensee's ability to engage in significant and deleterious alterations of a copyrighted work. *See Gilliam v. ABC*, 538 F.2d 14, 21 (2d Cir. 1976); *WGN Cont'l Broad. Co. v. United Video, Inc.*, 693 F.2d 622, 625 (7th Cir. 1982). The relevance of those two cases for the present one is limited, however, both because those cases involved substantial alterations of a copyrighted work, *see Gilliam*, 538 F.2d at 18, and because in neither case was there any claim that the copyright holder was, in asserting its rights, violating the antitrust laws, *see WGN Cont'l Broad.*, 693 F.2d at 626; *see also Cmty. for Creative Non–Violence v. Reid*, 846 F.2d 1485, 1498 (D.C. Cir. 1988) (noting, again in a context free of any antitrust concern, that "an author [ ] may have rights against" a licensee that "excessively mutilated or altered" the copyrighted work).

The only license restriction Microsoft seriously defends as necessary to prevent a "substantial alteration" of its copyrighted work is the prohibition on OEMs automatically launching a substitute user interface upon completion of the boot process. *See Findings of Fact* ¶ 211 ("[A] few large OEMs developed programs that ran automatically at the conclusion of a new PC system's first boot sequence. These programs replaced the Windows desktop either with a user interface designed by the OEM or with Navigator's user interface."). We agree that a shell that automatically prevents the Windows desktop from ever being seen by the user is a drastic alteration of Microsoft's copyrighted work, and outweighs the marginal anticompetitive effect of prohibiting the OEMs from substituting a different interface automatically upon completion of the initial boot process. We therefore hold that this particular restriction is not an exclusionary practice that violates § 2 of the Sherman Act.

In a second variation upon its copyright defense, Microsoft argues that the license restrictions merely prevent OEMs from taking actions that would reduce substantially the value of Microsoft's copyrighted work: that is, Microsoft claims each license restriction in question is necessary to prevent OEMs from so altering Windows as to undermine "the principal value of Windows as a stable and consistent platform that supports a broad range of applications and that is familiar to users." Appellant's Opening Br. at 102. Microsoft, however, never substantiates this claim, and, because an OEM's altering the appearance of the desktop or promoting programs in the boot sequence does not affect the code already in the product, the practice does not self-evidently affect either the "stability" or the "consistency" of the platform. *See Conclusions of Law*, at 41; *Findings of Fact* ¶ 227. Microsoft cites only one item of evidence in support of its claim that the OEMs' alterations were decreasing the value of Windows. Defendant's Trial Exhibit ("DX") 2395 at MSV0009378A, *reprinted in* 19 J.A. at 12575. That document, prepared by Microsoft itself, states: "there are quality issues created by OEMs who are too liberal with the pre-install process," referring to the OEMs' installation of Windows and additional software on their PCs, which the document says may result in "user concerns and confusion." To the extent the OEMs' modifications cause consumer confusion, of course, the OEMs bear the additional support costs. *See Findings of Fact* ¶ 159. Therefore, we conclude Microsoft has not shown that the OEMs' liberality reduces the value of Windows except in the sense that their promotion of rival browsers undermines Microsoft's monopoly—and that is not a permissible justification for the license restrictions.

Apart from copyright, Microsoft raises one other defense of the OEM license agreements: It argues that, despite the restrictions in the OEM license, Netscape is not completely blocked from distributing its product. That claim is insufficient to shield Microsoft from liability for those restrictions because, although Microsoft did not bar its rivals from all means of distribution, it did bar them from the cost-efficient ones.

In sum, we hold that with the exception of the one restriction prohibiting automatically launched alternative interfaces, all the OEM license restrictions at issue represent uses of Microsoft's market power to protect its monopoly, unredeemed by any legitimate justification. The restrictions therefore violate § 2 of the Sherman Act.

2. Integration of IE and Windows

Although Microsoft's license restrictions have a significant effect in closing rival browsers out of one of the two primary channels of distribution, the District Court found that "Microsoft's executives believed . . . its contractual restrictions placed on OEMs would not be sufficient in themselves to reverse the direction of Navigator's usage share. Consequently, in late 1995 or early 1996, Microsoft set out to bind [IE] more tightly to Windows 95 as a technical matter." *Findings of Fact* ¶ 160.

Technologically binding IE to Windows, the District Court found, both prevented OEMs from pre-installing other browsers and deterred consumers from using them. In particular, having the IE software code as an irremovable part of Windows meant that pre-installing a second browser would "increase an OEM's product testing costs," because an OEM must test and train its support staff to answer calls related to every software product preinstalled on the machine; moreover, pre-installing a browser in addition to IE would to many OEMs be "a questionable use of the scarce and valuable space on a PC's hard drive." *Id.* ¶ 159.

Although the District Court, in its Conclusions of Law, broadly condemned Microsoft's decision to bind "Internet Explorer to Windows with . . . technological shackles," *Conclusions of Law,* at 39, its findings of fact in support of that conclusion center upon three specific actions Microsoft took to weld IE to Windows: excluding IE from the "Add/Remove Programs" utility; designing Windows so as in certain circumstances to override the user's choice of a default browser other than IE; and commingling code related to browsing and other code in the same files, so that any attempt to delete the files containing IE would, at the same time, cripple the operating system. As with the license restrictions, we consider first whether the suspect actions had an anticompetitive effect, and then whether Microsoft has provided a procompetitive justification for them.

a. *Anticompetitive effect of integration*

As a general rule, courts are properly very skeptical about claims that competition has been harmed by a dominant firm's product design changes. *See, e.g., Foremost Pro Color, Inc. v. Eastman Kodak Co.*, 703 F.2d 534, 544–45 (9th Cir. 1983). In a competitive market, firms routinely innovate in the hope of appealing to consumers, sometimes in the process making their products incompatible with those of rivals; the imposition of liability when a monopolist does the same thing will inevitably deter a certain amount of innovation. This is all the more true in a market, such as this one, in which the product itself is rapidly changing. *See Findings of Fact* ¶ 59. Judicial deference to product innovation, however, does not mean that a monopolist's product design decisions are per se lawful. *See Foremost Pro Color*, 703 F.2d at 545; *see also Cal. Computer Prods.*, 613 F.2d at 739, 744; *In re IBM Peripheral EDP Devices Antitrust Litig.*, 481 F. Supp. 965, 1007–08 (N.D. Cal. 1979).

The District Court first condemned as anticompetitive Microsoft's decision to exclude IE from the "Add/Remove Programs" utility in Windows 98. *Findings of Fact* ¶ 170. Microsoft had included IE in the Add/Remove Programs utility in Windows 95, *see id.* ¶ ¶ 175–76, but when it modified Windows 95 to produce Windows 98, it took IE out of the Add/Remove Programs utility. This change reduces the usage share of rival browsers not by making Microsoft's own browser more attractive to consumers but, rather, by discouraging OEMs from distributing rival products. *See id.* ¶ 159. Because Microsoft's conduct, through something other than competition on the merits, has the effect of significantly reducing usage of rivals' products and hence protecting its own operating system monopoly, it is anticompetitive; we defer for the moment the question whether it is nonetheless justified.

Second, the District Court found that Microsoft designed Windows 98 "so that using Navigator on Windows 98 would have unpleasant consequences for users" by, in some circumstances, overriding the user's choice of a browser other than IE as his or her default browser. *Id.* ¶ ¶ 171–72. Plaintiffs argue that this override harms the competitive process by deterring consumers from using a browser other than IE even though they might prefer to do so, thereby reducing rival browsers' usage share and, hence, the ability of rival browsers to draw developer attention away from the APIs exposed by Windows. Microsoft does not deny, of course, that overriding the user's preference prevents some people from using other browsers. Because the override reduces rivals' usage share and protects Microsoft's monopoly, it too is anticompetitive.

Finally, the District Court condemned Microsoft's decision to bind IE to Windows 98 "by placing code specific to Web browsing in the same files as code that provided operating system functions." *Id.* ¶ 161; *see also id.* ¶ ¶ 174, 192. Putting code supplying browsing functionality into a file with code supplying operating system functionality "ensure[s] that the deletion of any file containing browsing-specific routines would also delete vital operating system routines and thus cripple Windows. . . ." *Id.* ¶ 164. As noted above, preventing an OEM from removing IE deters it from installing a second browser because doing so increases the OEM's product testing and support costs; by contrast, had OEMs been able to remove IE, they might have chosen to pre-install Navigator alone. *See id.* ¶ 159.

Microsoft denies, as a factual matter, that it commingled browsing and non-browsing code, and it maintains the District Court's findings to the contrary are clearly erroneous. According to Microsoft, its expert "testified without contradiction that '[t]he very same code in Windows 98 that provides Web browsing functionality' also performs essential operating system functions—not code in the same files, but the very same software code." Appellant's Opening Br. at 79 (citing 5 J.A. 3291–92).

Microsoft's expert did not testify to that effect "without contradiction," however. A Government expert, Glenn Weadock, testified that Microsoft "design[ed] [IE] so that some of the code that it uses co-resides in the same library files as other code needed for Windows." Direct Testimony ¶ 30. Another Government expert likewise testified that one library file, SHDOCVW.DLL, "is really a bundle of separate functions. It contains some functions that have to do specifically with Web browsing, and it contains some general user interface functions as well." 12/14/98 am Tr. at 60–61 (trial testimony of Edward Felten), *reprinted in* 11 J.A. at 6953–54. One of Microsoft's own documents suggests as much. *See* Plaintiffs' Proposed Findings of Fact ¶ 131.2.vii (citing GX 1686 (under seal) (Microsoft document indicating some functions in SHDOCVW.DLL can be described as "IE only," others can be described as "shell only" and still others can be described as providing both "IE" and "shell" functions)).

In view of the contradictory testimony in the record, some of which supports the District Court's finding that Microsoft commingled browsing and non-browsing code, we cannot conclude that the finding was clearly erroneous. *See Anderson v. City of Bessemer City*, 470 U.S. 564, 573–74 (1985) ("If the district court's account of the evidence is plausible in light of the record viewed in its entirety, the court of appeals may not reverse it even though convinced that had it been sitting as the trier of fact, it would have weighed the evidence differently."). Accordingly, we reject Microsoft's argument that we should vacate Finding of Fact 159 as it relates to the commingling of code, and we conclude that such commingling has an anticompetitive effect; as noted above, the commingling deters OEMs from pre-installing rival browsers, thereby reducing the rivals' usage share and, hence, developers' interest in rivals' APIs as an alternative to the API set exposed by Microsoft's operating system.

b. *Microsoft's justifications for integration*

Microsoft proffers no justification for two of the three challenged actions that it took in integrating IE into Windows—excluding IE from the Add/Remove Programs utility and commingling browser and operating system code. Although Microsoft does make some general claims regarding the benefits of integrating the browser and the operating system, *see, e.g.,* Direct Testimony of James Allchin ¶ 94, *reprinted in* 5 J.A. at 3321 ("Our vision of deeper levels of technical integration is highly efficient and provides substantial benefits to customers and developers."), it neither specifies nor substantiates those claims. Nor does it argue that either excluding IE from the Add/Remove Programs utility or commingling code achieves any integrative benefit. Plaintiffs plainly made out a *prima facie* case of harm to competition in the operating system market by demonstrating that Microsoft's actions increased its browser usage share and thus protected its operating system monopoly from a middleware threat and, for its part, Microsoft failed to meet its burden of showing that its conduct serves a purpose other than protecting its operating system monopoly. Accordingly, we hold that Microsoft's exclusion of IE from the Add/Remove Programs utility and its commingling of browser and operating system code constitute exclusionary conduct, in violation of § 2.

As for the other challenged act that Microsoft took in integrating IE into Windows—causing Windows to override the user's choice of a default browser in certain circumstances—Microsoft argues that it has "valid technical reasons." Specifically, Microsoft claims that it was necessary to design Windows to override the user's preferences when he or she invokes one of "a few" out "of the nearly 30 means of accessing the Internet." Appellant's Opening Br. at 82. According to Microsoft:

> The Windows 98 Help system and Windows Update feature depend on ActiveX controls not supported by Navigator, and the now-discontinued Channel Bar utilized Microsoft's Channel Definition Format, which Navigator also did not support. Lastly, Windows 98 does not invoke Navigator if a user accesses the Internet through "My Computer" or "Windows Explorer" because doing so would defeat one of the purposes of those features—enabling users to move seamlessly from local storage devices to the Web *in the same browsing window.*

Id. (internal citations omitted). The plaintiff bears the burden not only of rebutting a proffered justification but also of demonstrating that the anticompetitive effect of the challenged action outweighs it. In the District Court, plaintiffs appear to have done neither, let alone both; in any event, upon appeal, plaintiffs offer no rebuttal whatsoever. Accordingly, Microsoft may not be held liable for this aspect of its product design.

3. Agreements with Internet Access Providers

The District Court also condemned as exclusionary Microsoft's agreements with various IAPs. The IAPs include both Internet Service Providers, which offer consumers internet access, and Online Services ("OLSs") such as America Online

("AOL"), which offer proprietary content in addition to internet access and other services. *Findings of Fact* ¶ 15. The District Court deemed Microsoft's agreements with the IAPs unlawful because:

> Microsoft licensed [IE] and the [IE] Access Kit [(of which, more below)] to hundreds of IAPs for no charge. [*Findings of Fact*] ¶ ¶ 250–51. Then, Microsoft extended valuable promotional treatment to the ten most important IAPs in exchange for their commitment to promote and distribute [IE] and to exile Navigator from the desktop. *Id.* ¶ ¶ 255–58, 261, 272, 288–90, 305–06. Finally, in exchange for efforts to upgrade existing subscribers to client software that came bundled with [IE] instead of Navigator, Microsoft granted rebates—and in some cases made outright payments—to those same IAPs. *Id.* ¶ ¶ 259–60, 295.

Conclusions of Law, at 41.

The District Court condemned Microsoft's actions in (1) offering IE free of charge to IAPs and (2) offering IAPs a bounty for each customer the IAP signs up for service using the IE browser. In effect, the court concluded that Microsoft is acting to preserve its monopoly by offering IE to IAPs at an attractive price. Similarly, the District Court held Microsoft liable for (3) developing the IE Access Kit ("IEAK"), a software package that allows an IAP to "create a distinctive identity for its service in as little as a few hours by customizing the [IE] title bar, icon, start and search pages," *Findings of Fact* ¶ 249, and (4) offering the IEAK to IAPs free of charge, on the ground that those acts, too, helped Microsoft preserve its monopoly. *Conclusions of Law*, at 41–42. Finally, the District Court found that (5) Microsoft agreed to provide easy access to IAPs' services from the Windows desktop in return for the IAPs' agreement to promote IE exclusively and to keep shipments of internet access software using Navigator under a specific percentage, typically 25%. *See Conclusions of Law*, at 42 (citing *Findings of Fact* ¶ ¶ 258, 262, 289). We address the first four items—Microsoft's inducements—and then its exclusive agreements with IAPs.

Although offering a customer an attractive deal is the hallmark of competition, the Supreme Court has indicated that in very rare circumstances a price may be unlawfully low, or "predatory." *See generally Brooke Group,* 509 U.S. at 220–27. Plaintiffs argued before the District Court that Microsoft's pricing was indeed predatory; but instead of making the usual predatory pricing argument—that the predator would drive out its rivals by pricing below cost on a particular product and then, sometime in the future, raise its prices on that product above the competitive level in order to recoup its earlier losses—plaintiffs argued that by pricing below cost on IE (indeed, even paying people to take it), Microsoft was able simultaneously to preserve its stream of monopoly profits on Windows, thereby more than recouping its investment in below-cost pricing on IE. The District Court did not assign liability for predatory pricing, however, and plaintiffs do not press this theory on appeal.

The rare case of price predation aside, the antitrust laws do not condemn even a monopolist for offering its product at an attractive price, and we therefore have no warrant to condemn Microsoft for offering either IE or the IEAK free of charge or even at a negative price. Likewise, as we said above, a monopolist does not violate the Sherman Act simply by developing an attractive product. *See Grinnell*, 384 U.S. at 571 ("[G]rowth or development as a consequence of a superior product [or] business acumen" is no violation.). Therefore, Microsoft's development of the IEAK does not violate the Sherman Act.

We turn now to Microsoft's deals with IAPs concerning desktop placement. Microsoft concluded these exclusive agreements with all "the leading IAPs," *Findings of Fact* ¶ 244, including the major OLSs. *Id.* ¶ 245; *see also id.* ¶ ¶ 305, 306. The most significant of the OLS deals is with AOL, which, when the deal was reached, "accounted for a substantial portion of all existing Internet access subscriptions and . . . attracted a very large percentage of new IAP subscribers." *Id.* ¶ 272. Under that agreement Microsoft puts the AOL icon in the OLS folder on the Windows desktop and AOL does not promote any non-Microsoft browser, nor provide software using any non-Microsoft browser except at the customer's request, and even then AOL will not supply more than 15% of its subscribers with a browser other than IE. *Id.* ¶ 289.

The Supreme Court most recently considered an antitrust challenge to an exclusive contract in *Tampa Electric Co. v. Nashville Coal Co.*, 365 U.S. 320 (1961). That case, which involved a challenge to a requirements contract, was brought under § 3 of the Clayton Act and §§ 1 and 2 of the Sherman Act. The Court held that an exclusive contract does not violate the Clayton Act unless its probable effect is to "foreclose competition in a substantial share of the line of commerce affected." *Id.* at 327. The share of the market foreclosed is important because, for the contract to have an adverse effect upon competition, "the opportunities for other traders to enter into or remain in that market must be significantly limited." *Id.* at 328. Although "[n]either the Court of Appeals nor the District Court [had] considered in detail the question of the relevant market," *id.* at 330, the Court in *Tampa Electric* examined the record and, after defining the relevant market, determined that the contract affected less than one percent of that market. *Id.* at 333. After concluding, under the Clayton Act, that this share was "conservatively speaking, quite insubstantial," *id.*, the Court went on summarily to reject the Sherman Act claims. *Id.* at 335 ("[I]f [the contract] does not fall within the broader prescription of § 3 of the Clayton Act it follows that it is not forbidden by those of the [Sherman Act].").

Following *Tampa Electric*, courts considering antitrust challenges to exclusive contracts have taken care to identify the share of the market foreclosed. Some courts have indicated that § 3 of the Clayton Act and § 1 of the Sherman Act require an equal degree of foreclosure before prohibiting exclusive contracts. *See, e.g., Roland Mach. Co. v. Dresser Indus., Inc.*, 749 F.2d 380, 393 (7th Cir. 1984) (Posner, J.). Other courts, however, have held that a higher market share must be foreclosed in order to establish a violation of the Sherman Act as compared to the Clayton Act. *See, e.g., Barr Labs. v. Abbott Labs.*, 978 F.2d 98, 110 (3d Cir.1992); 11 HERBERT HOVENKAMP, ANTITRUST LAW ¶ 1800c4 (1998) ("[T]he cases are divided, with a likely majority stating that the

Clayton Act requires a smaller showing of anticompetitive effects.").

Though what is "significant" may vary depending upon the antitrust provision under which an exclusive deal is challenged, it is clear that in all cases the plaintiff must both define the relevant market and prove the degree of foreclosure. This is a prudential requirement; exclusivity provisions in contracts may serve many useful purposes. *See, e.g., Omega Envtl., Inc. v. Gilbarco, Inc.,* 127 F.3d 1157, 1162 (9th Cir. 1997) ("There are, however, well-recognized economic benefits to exclusive dealing arrangements, including the enhancement of interbrand competition."); *Barry Wright Corp. v. ITT Grinnell Corp.,* 724 F.2d 227, 236 (1st Cir. 1983) (Breyer, J.) ("[V]irtually *every* contract to buy 'forecloses' or 'excludes' alternative sellers from *some* portion of the market, namely the portion consisting of what was bought."). Permitting an antitrust action to proceed any time a firm enters into an exclusive deal would both discourage a presumptively legitimate business practice and encourage costly antitrust actions. Because an exclusive deal affecting a small fraction of a market clearly cannot have the requisite harmful effect upon competition, the requirement of a significant degree of foreclosure serves a useful screening function. *Cf.* Frank H. Easterbrook, *The Limits of Antitrust*, 63 TEX. L. REV. 1, 21–23 (1984) (discussing use of presumptions in antitrust law to screen out cases in which loss to consumers and economy is likely outweighed by cost of inquiry and risk of deterring procompetitive behavior).

In this case, plaintiffs challenged Microsoft's exclusive dealing arrangements with the IAPs under both §§ 1 and 2 of the Sherman Act. The District Court, in analyzing the § 1 claim, stated, "unless the evidence demonstrates that Microsoft's agreements excluded Netscape altogether from access to roughly forty percent of the browser market, the Court should decline to find such agreements in violation of § 1." *Conclusions of Law,* at 52. The court recognized that Microsoft had substantially excluded Netscape from "the most efficient channels for Navigator to achieve browser usage share," *id.* at 53; *see also Findings of Fact* ¶ 145 ("[N]o other distribution channel for browsing software even approaches the efficiency of OEM pre-installation and IAP bundling."), and had relegated it to more costly and less effective methods (such as mass mailing its browser on a disk or offering it for download over the internet); but because Microsoft has not "completely excluded Netscape" from reaching any potential user by some means of distribution, however ineffective, the court concluded the agreements do not violate § 1. *Conclusions of Law,* at 53. Plaintiffs did not cross-appeal this holding.

Turning to § 2, the court stated: "the fact that Microsoft's arrangements with various [IAPs and other] firms did not foreclose enough of the relevant market to constitute a § 1 violation in no way detracts from the Court's assignment of liability for the same arrangements under § 2.... [A]ll of Microsoft's agreements, including the non-exclusive ones, severely restricted Netscape's access to those distribution channels leading most efficiently to the acquisition of browser usage share." *Conclusions of Law,* at 53.

On appeal Microsoft argues that "courts have applied the same standard to alleged exclusive dealing agreements under both Section 1 *and* Section 2," Appellant's Opening Br. at 109, and it argues that the District Court's holding of no liability under § 1 necessarily precludes holding it liable under § 2. The District Court appears to have based its holding with respect to § 1 upon a "total exclusion test" rather than the 40% standard drawn from the caselaw. Even assuming the holding is correct, however, we nonetheless reject Microsoft's contention.

The basic prudential concerns relevant to §§ 1 and 2 are admittedly the same: exclusive contracts are commonplace—particularly in the field of distribution—in our competitive, market economy, and imposing upon a firm with market power the risk of an antitrust suit every time it enters into such a contract, no matter how small the effect, would create an unacceptable and unjustified burden upon any such firm. At the same time, however, we agree with plaintiffs that a monopolist's use of exclusive contracts, in certain circumstances, may give rise to a § 2 violation even though the contracts foreclose less than the roughly 40% or 50% share usually required in order to establish a § 1 violation. *See generally* Dennis W. Carlton, *A General Analysis of Exclusionary Conduct and Refusal to Deal—Why* Aspen *and* Kodak *Are Misguided*, 68 ANTITRUST L.J. 659 (2001) (explaining various scenarios under which exclusive dealing, particularly by a dominant firm, may raise legitimate concerns about harm to competition).

In this case, plaintiffs allege that, by closing to rivals a substantial percentage of the available opportunities for browser distribution, Microsoft managed to preserve its monopoly in the market for operating systems. The IAPs constitute one of the two major channels by which browsers can be distributed. *Findings of Fact* ¶ 242. Microsoft has exclusive deals with "fourteen of the top fifteen access providers in North America[, which] account for a large majority of all Internet access subscriptions in this part of the world." *Id.* ¶ 308. By ensuring that the "majority" of all IAP subscribers are offered IE either as the default browser or as the only browser, Microsoft's deals with the IAPs clearly have a significant effect in preserving its monopoly; they help keep usage of Navigator below the critical level necessary for Navigator or any other rival to pose a real threat to Microsoft's monopoly. *See, e.g., id.* ¶ 143 (Microsoft sought to "divert enough browser usage from Navigator to neutralize it as a platform."); *see also* Carlton, at 670.

Plaintiffs having demonstrated a harm to competition, the burden falls upon Microsoft to defend its exclusive dealing contracts with IAPs by providing a procompetitive justification for them. Significantly, Microsoft's only explanation for its exclusive dealing is that it wants to keep developers focused upon its APIs—which is to say, it wants to preserve its power in the operating system market. 02/26/01 Ct. Appeals Tr. at 45–47. That is not an unlawful end, but neither is it a procompetitive justification for the specific means here in question, namely exclusive dealing contracts with IAPs. Accordingly, we affirm the District Court's decision holding that Microsoft's exclusive contracts with IAPs are exclusionary devices, in violation of § 2 of the Sherman Act.

4. Dealings with Internet Content Providers, Independent Software Vendors, and Apple Computer

The District Court held that Microsoft engages in exclusionary conduct in its dealings with ICPs, which develop websites; ISVs, which develop software; and Apple, which is both an OEM and a software developer. *See Conclusions of Law*, at 42–43 (deals with ICPs, ISVs, and Apple "supplemented Microsoft's efforts in the OEM and IAP channels"). The District Court condemned Microsoft's deals with ICPs and ISVs, stating: "By granting ICPs and ISVs free licenses to bundle [IE] with their offerings, and by exchanging other valuable inducements for their agreement to distribute, promote[,] and rely on [IE] rather than Navigator, Microsoft directly induced developers to focus on its own APIs rather than ones exposed by Navigator." *Id.* (citing *Findings of Fact* ¶ ¶ 334–35, 340).

With respect to the deals with ICPs, the District Court's findings do not support liability. After reviewing the ICP agreements, the District Court specifically stated that "there is not sufficient evidence to support a finding that Microsoft's promotional restrictions actually had a substantial, deleterious impact on Navigator's usage share." *Findings of Fact* ¶ 332. Because plaintiffs failed to demonstrate that Microsoft's deals with the ICPs have a substantial effect upon competition, they have not proved the violation of the Sherman Act.

As for Microsoft's ISV agreements, however, the District Court did not enter a similar finding of no substantial effect. The District Court described Microsoft's deals with ISVs as follows:

> In dozens of "First Wave" agreements signed between the fall of 1997 and the spring of 1998, Microsoft has promised to give preferential support, in the form of early Windows 98 and Windows NT betas, other technical information, and the right to use certain Microsoft

> seals of approval, to important ISVs that agree to certain conditions. One of these conditions is that the ISVs use Internet Explorer as the default browsing software for any software they develop with a hypertext-based user interface. Another condition is that the ISVs use Microsoft's "HTML Help," which is accessible only with Internet Explorer, to implement their applications' help systems.

Id. ¶ 339. The District Court further found that the effect of these deals is to "ensure [ ] that many of the most popular Web-centric applications will rely on browsing technologies found only in Windows," *id.* ¶ 340, and that Microsoft's deals with ISVs therefore "increase[ ] the likelihood that the millions of consumers using [applications designed by ISVs that entered into agreements with Microsoft] will use Internet Explorer rather than Navigator." *Id.* ¶ 340.

The District Court did not specifically identify what share of the market for browser distribution the exclusive deals with the ISVs foreclose. Although the ISVs are a relatively small channel for browser distribution, they take on greater significance because, as discussed above, Microsoft had largely foreclosed the two primary channels to its rivals. In that light, one can tell from the record that by affecting the applications used by "millions" of consumers, Microsoft's exclusive deals with the ISVs had a substantial effect in further foreclosing rival browsers from the market. (Data introduced by Microsoft, *see* Direct Testimony of Cameron Myhrvold ¶ 84, *reprinted in* 6 J.A. at 3922–23, and subsequently relied upon by the District Court in its findings, *see, e.g.*, *Findings of Fact* ¶ 270, indicate that over the two-year period 1997–98, when Microsoft entered into the First Wave agreements, there were 40 million new users of the internet.) Because, by keeping rival browsers from gaining widespread distribution (and potentially attracting the attention of developers away from the APIs in Windows), the deals have a substantial effect in preserving Microsoft's monopoly, we hold that plaintiffs have made a *prima facie* showing that the deals have an anticompetitive effect.

Of course, that Microsoft's exclusive deals have the anti-competitive effect of preserving Microsoft's monopoly does not, in itself, make them unlawful. A monopolist, like a competitive firm, may have a perfectly legitimate reason for wanting an exclusive arrangement with its distributors. Accordingly, Microsoft had an opportunity to, but did not, present the District Court with evidence demonstrating that the exclusivity provisions have some such procompetitive justification. *See Conclusions of Law*, at 43 (citing *Findings of Fact* ¶¶ 339–40) ("With respect to the ISV agreements, Microsoft has put forward no procompetitive business ends whatsoever to justify their exclusionary terms."). On appeal Microsoft likewise does not claim that the exclusivity required by the deals serves any legitimate purpose; instead, it states only that its ISV agreements reflect an attempt "to persuade ISVs to utilize Internet-related system services in Windows rather than Navigator." Appellant's Opening Br. at 114. As we explained before, however, keeping developers focused upon Windows—that is, preserving the Windows monopoly—is a competitively neutral goal. Microsoft having offered no procompetitive justification for its exclusive dealing arrangements with the ISVs, we hold that those arrangements violate § 2 of the Sherman Act.

Finally, the District Court held that Microsoft's dealings with Apple violated the Sherman Act. *See Conclusions of Law*, at 42–43. Apple is vertically integrated: it makes both software (including an operating system, Mac OS), and hardware (the Macintosh line of computers). Microsoft primarily makes software, including, in addition to its operating system, a number of popular applications. One, called "Office," is a suite of business productivity applications that Microsoft has ported to Mac OS. The District Court found that "ninety percent of Mac OS users running a suite of office productivity applications [use] Microsoft's Mac Office." *Findings of Fact* ¶ 344. Further, the District Court found that:

> In 1997, Apple's business was in steep decline, and many doubted that the company would survive much long-

> er. . . . [M]any ISVs questioned the wisdom of continuing to spend time and money developing applications for the Mac OS. Had Microsoft announced in the midst of this atmosphere that it was ceasing to develop new versions of Mac Office, a great number of ISVs, customers, developers, and investors would have interpreted the announcement as Apple's death notice.

Id. ¶ 344. Microsoft recognized the importance to Apple of its continued support of Mac Office. *See id.* ¶ 347 (quoting internal Microsoft e-mail) ("[We] need a way to push these guys[, *i.e.*, Apple] and [threatening to cancel Mac Office] is the only one that seems to make them move."); *see also id.* ("[Microsoft Chairman Bill] Gates asked whether Microsoft could conceal from Apple in the coming month the fact that Microsoft was almost finished developing Mac Office 97."); *id.* at ¶ 354 ("I think . . . Apple should be using [IE] everywhere and if they don't do it, then we can use Office as a club.").

In June 1997 Microsoft Chairman Bill Gates determined that the company's negotiations with Apple " 'have not been going well at all. . . . Apple let us down on the browser by making Netscape the standard install.' Gates then reported that he had already called Apple's CEO . . . to ask 'how we should announce the cancellation of Mac Office. . . .' " *Id.* at ¶ 349. The District Court further found that, within a month of Gates' call, Apple and Microsoft had reached an agreement pursuant to which

> Microsoft's primary obligation is to continue releasing up-to-date versions of Mac Office for at least five years. . . . [and] Apple has agreed . . . to "bundle the most current version of [IE] . . . with [Mac OS]". . . [and to] "make [IE] the default [browser]". . . . Navigator is not installed on the computer hard drive during the default installation, which is the type of installation most users elect to employ. . . . [The] Agreement further provides that . . . Apple may not position icons for non-Microsoft browsing software on the desktop of new Macintosh PC systems or Mac OS upgrades.

Id. ¶ ¶ 350–52. The agreement also prohibits Apple from encouraging users to substitute another browser for IE, and states that Apple will "encourage its employees to use [IE]." *Id.* ¶ 352.

This exclusive deal between Microsoft and Apple has a substantial effect upon the distribution of rival browsers. If a browser developer ports its product to a second operating system, such as the Mac OS, it can continue to display a common set of APIs. Thus, usage share, not the underlying operating system, is the primary determinant of the platform challenge a browser may pose. Pre-installation of a browser (which can be accomplished either by including the browser with the operating system or by the OEM installing the browser) is one of the two most important methods of browser distribution, and Apple had a not insignificant share of worldwide sales of operating systems. *See id.* ¶ 35 (Microsoft has 95% of the market not counting Apple and "well above" 80% with Apple included in the relevant market). Because Microsoft's exclusive contract with Apple has a substantial effect in restricting distribution of rival browsers, and because (as we have described several times above) reducing usage share of rival browsers serves to protect Microsoft's monopoly, its deal with Apple must be regarded as anticompetitive. *See Conclusions of Law*, at 42 (citing *Findings of Fact* ¶ 356) ("By extracting from Apple terms that significantly diminished the usage of Navigator on the Mac OS, Microsoft helped to ensure that developers would not view Navigator as truly cross-platform middleware.").

Microsoft offers no procompetitive justification for the exclusive dealing arrangement. It makes only the irrelevant claim that the IE-for-Mac Office deal is part of a multifaceted set of agreements between itself and Apple, *see* Appellant's Opening Br. at 61 ("Apple's 'browsing software' obligation was [not] the quid pro quo for Microsoft's Mac Office obligation[;] . . . *all* of the various obligations . . . were part of one 'overall agreement' between the two companies."); that does not mean it has any procompetitive justification. Accordingly, we hold that the exclusive deal with Apple is exclusionary, in violation of § 2 of the Sherman Act.

5. Java

Java, a set of technologies developed by Sun Microsystems, is another type of middleware posing a potential threat to Windows' position as the ubiquitous platform for software development. *Findings of Fact* ¶ 28. The Java technologies include: (1) a programming language; (2) a set of programs written in that language, called the "Java class libraries," which expose APIs; (3) a compiler, which translates code written by a developer into "bytecode"; and (4) a Java Virtual Machine ("JVM"), which translates bytecode into instructions to the operating system. *Id.* ¶ 73. Programs calling upon the Java APIs will run on any machine with a "Java runtime environment," that is, Java class libraries and a JVM. *Id.* ¶ ¶ 73, 74.

In May 1995 Netscape agreed with Sun to distribute a copy of the Java runtime environment with every copy of Navigator, and "Navigator quickly became the principal vehicle by which Sun placed copies of its Java runtime environment on the PC systems of Windows users." *Id.* ¶ 76. Microsoft, too, agreed to promote the Java technologies—or so it seemed. For at the same time, Microsoft took steps "to maximize the difficulty with which applications written in Java could be ported from Windows to other platforms, and vice versa." *Conclusions of Law,* at 43. Specifically, the District Court found that Microsoft took four steps to exclude Java from developing as a viable cross-platform threat: (a) designing a JVM incompatible with the one developed by Sun; (b) entering into contracts, the so-called "First Wave Agreements," requiring major ISVs to promote Microsoft's JVM exclusively; (c) deceiving Java developers about the Windows-specific nature of the tools it distributed to them; and (d) coercing Intel to stop aiding Sun in improving the Java technologies.

a. *The incompatible JVM*

The District Court held that Microsoft engaged in exclusionary conduct by developing and promoting its own JVM. *Conclusions of Law,* at 43–44. Sun had already developed a JVM for the Windows operating system when Microsoft began work on its version. The JVM developed by Microsoft allows Java applications to run faster on Windows than does Sun's JVM, *Findings of Fact* ¶ 389, but a Java application designed to work with Microsoft's JVM does not work with Sun's JVM and vice versa. *Id.* ¶ 390. The District Court found that Microsoft "made a large investment of engineering resources to develop a high-performance Windows JVM," *id.* ¶ 396, and, "[b]y bundling its . . . JVM with every copy of [IE] . . . Microsoft endowed its Java runtime environment with the unique attribute of guaranteed, enduring ubiquity across the enormous Windows installed base," *id.* ¶ 397. As explained above, however, a monopolist does not violate the antitrust laws simply by developing a product that is incompatible with those of its rivals. *See supra* Section II.B.1. In order to violate the antitrust laws, the incompatible product must have an anticompetitive effect that outweighs any procompetitive justification for the design. Microsoft's JVM is not only incompatible with Sun's, it allows Java applications to run faster on Windows than does Sun's JVM. Microsoft's faster JVM lured Java developers into using Microsoft's developer tools, and Microsoft offered those tools deceptively, as we discuss below. The JVM, however, does allow applications to run more swiftly and does not itself have any anticompetitive effect. Therefore, we reverse the District Court's imposition of liability for Microsoft's development and promotion of its JVM.

b. *The First Wave Agreements*

The District Court also found that Microsoft entered into First Wave Agreements with dozens of ISVs to use Microsoft's JVM. *See Findings of Fact* ¶ 401 ("[I]n exchange for costly technical support and other blandishments, Microsoft induced dozens of important ISVs to make their Java applications reliant on Windows-specific technologies and to refrain from distributing to Windows users JVMs that complied with Sun's standards."). Again, we reject the District Court's condemnation of low but non-predatory pricing by Microsoft.

To the extent Microsoft's First Wave Agreements with the ISVs conditioned receipt of Windows technical information upon the ISVs' agreement to promote Microsoft's JVM exclusively, they raise a different competitive concern. The District Court found that, although not literally exclusive, the deals were exclusive in practice because they required developers to make Microsoft's JVM the default in the software they developed. *Id.* ¶ 401.

While the District Court did not enter precise findings as to the effect of the First Wave Agreements upon the overall distribution of rival JVMs, the record indicates that Microsoft's deals with the major ISVs had a significant effect upon JVM promotion. As discussed above, the products of First Wave ISVs reached millions of consumers. *Id.* ¶ 340. The First Wave ISVs included such prominent developers as Rational Software, *see* GX 970, *reprinted in* 15 J.A. at 9994–10000, "a world leader" in software development tools, *see* Direct Testimony of Michael Devlin ¶ 2, *reprinted in* 5 J.A. at 3520, and Symantec, *see* GX 2071, *reprinted in* 22 J.A. at 14960–66 (sealed), which, according to Microsoft itself, is "the leading supplier of utilities such as anti-virus software," Defendant's Proposed Findings of Fact ¶ 276, *reprinted in* 3 J.A. at 1689. Moreover, Microsoft's exclusive deals with the leading ISVs took place against a backdrop of foreclosure: the District Court found that "[w]hen Netscape announced in May 1995 [prior to Microsoft's execution of the First Wave Agreements] that it would include with every copy of Navigator a copy of a Windows JVM that complied with Sun's standards, it appeared that Sun's Java implementation would achieve the necessary ubiquity on Windows." *Findings of Fact* ¶ 394. As discussed above, however, Microsoft undertook a number of anticompetitive actions that seriously reduced the distribution of Navigator, and the District Court found that those actions thereby seriously impeded distribution of Sun's JVM. *Conclusions of Law*, at 43–44. Because Microsoft's agreements foreclosed a substantial portion of the field for JVM distribution and because, in so doing, they protected Microsoft's monopoly from a middleware threat, they are anticompetitive.

Microsoft offered no procompetitive justification for the default clause that made the First Wave Agreements exclusive as a practical matter. *See Findings of Fact* ¶ 401.

Because the cumulative effect of the deals is anticompetitive and because Microsoft has no procompetitive justification for them, we hold that the provisions in the First Wave Agreements requiring use of Microsoft's JVM as the default are exclusionary, in violation of the Sherman Act.

c. *Deception of Java developers*

Microsoft's "Java implementation" included, in addition to a JVM, a set of software development tools it created to assist ISVs in designing Java applications. The District Court found that, not only were these tools incompatible with Sun's cross-platform aspirations for Java—no violation, to be sure—but Microsoft deceived Java developers regarding the Windows-specific nature of the tools. Microsoft's tools included "certain 'keywords' and 'compiler directives' that could only be executed properly by Microsoft's version of the Java runtime environment for Windows." *Id.* ¶ 394; *see also* Direct Testimony of James Gosling ¶ 58, *reprinted in* 21 J.A. at 13959 (Microsoft added "programming instructions . . . that alter the behavior of the code."). As a result, even Java "developers who were opting for portability over performance . . . unwittingly [wrote] Java applications that [ran] only on Windows." *Conclusions of Law*, at 43. That is, developers who relied upon Microsoft's public commitment to cooperate with Sun and who used Microsoft's tools to develop what Microsoft led them to believe were cross-platform applications ended up producing applications that would run only on the Windows operating system.

When specifically accused by a *PC Week* reporter of fragmenting Java standards so as to prevent cross-platform uses, Microsoft denied the accusation and indicated it was only "adding rich platform support" to what remained a cross-platform implementation. An e-mail message internal to Microsoft, written shortly after the conversation with the reporter, shows otherwise:

> [O]k, i just did a followup call. . . . [The reporter] liked that i kept pointing customers to w3c standards [(commonly observed internet protocols)]. . . . [but] he accused us of being schizo with this vs. our java approach, i said

> he misunderstood [—] that [with Java] we are merely trying to add rich platform support to an interop layer. . . . this plays well. . . . at this point its [sic] not good to create MORE noise around our win32 java classes. instead we should just quietly grow j++ [(Microsoft's development tools)] share and assume that people will take more advantage of our classes without ever realizing they are building win32–only java apps.

GX 1332, *reprinted in* 22 J.A. at 14922–23.

Finally, other Microsoft documents confirm that Microsoft intended to deceive Java developers, and predicted that the effect of its actions would be to generate Windows-dependent Java applications that their developers believed would be cross-platform; these documents also indicate that Microsoft's ultimate objective was to thwart Java's threat to Microsoft's monopoly in the market for operating systems. One Microsoft document, for example, states as a strategic goal: "Kill cross-platform Java by grow[ing] the polluted Java market." GX 259, *reprinted in* 22 J.A. at 14514; *see also id.* ("Cross-platform capability is by far *the* number one reason for choosing/using Java.") (emphasis in original).

Microsoft's conduct related to its Java developer tools served to protect its monopoly of the operating system in a manner not attributable either to the superiority of the operating system or to the acumen of its makers, and therefore was anticompetitive. Unsurprisingly, Microsoft offers no procompetitive explanation for its campaign to deceive developers. Accordingly, we conclude this conduct is exclusionary, in violation of § 2 of the Sherman Act.

d. *The threat to Intel*

The District Court held that Microsoft also acted unlawfully with respect to Java by using its "monopoly power to prevent firms such as Intel from aiding in the creation of cross-platform interfaces." *Conclusions of Law,* at 43. In 1995 Intel was in the process of developing a high-performance, Windows-compatible JVM. Microsoft wanted Intel to abandon that effort because a fast, cross-platform

JVM would threaten Microsoft's monopoly in the operating system market. At an August 1995 meeting, Microsoft's Gates told Intel that its "cooperation with Sun and Netscape to develop a Java runtime environment . . . was one of the issues threatening to undermine cooperation between Intel and Microsoft." *Findings of Fact* ¶ 396. Three months later, "Microsoft's Paul Maritz told a senior Intel executive that Intel's [adaptation of its multimedia software to comply with] Sun's Java standards was as inimical to Microsoft as Microsoft's support for non-Intel microprocessors would be to Intel." *Id.* ¶ 405.

Intel nonetheless continued to undertake initiatives related to Java. By 1996 "Intel had developed a JVM designed to run well . . . while complying with Sun's cross-platform standards." *Id.* ¶ 396. In April of that year, Microsoft again urged Intel not to help Sun by distributing Intel's fast, Sun-compliant JVM. *Id.* And Microsoft threatened Intel that if it did not stop aiding Sun on the multimedia front, then Microsoft would refuse to distribute Intel technologies bundled with Windows. *Id.* ¶ 404.

Intel finally capitulated in 1997, after Microsoft delivered the *coup de grace*.

> [O]ne of Intel's competitors, called AMD, solicited support from Microsoft for its "3DX" technology. . . . Microsoft's Allchin asked Gates whether Microsoft should support 3DX, despite the fact that Intel would oppose it. Gates responded: "If Intel has a real problem with us supporting this then they will have to stop supporting Java Multimedia the way they are. I would gladly give up supporting this if they would back off from their work on JAVA."

Id. ¶ 406.

Microsoft's internal documents and deposition testimony confirm both the anticompetitive effect and intent of its actions. *See, e.g.,* GX 235, *reprinted in* 22 J.A. at 14502 (Microsoft executive, Eric Engstrom, included among Microsoft's goals for Intel: "Intel to stop helping Sun create Java

Multimedia APIs, especially ones that run well . . . on Windows."); Deposition of Eric Engstrom at 179 ("We were successful [in convincing Intel to stop aiding Sun] for some period of time.").

Microsoft does not deny the facts found by the District Court, nor does it offer any procompetitive justification for pressuring Intel not to support cross-platform Java. Microsoft lamely characterizes its threat to Intel as "advice." The District Court, however, found that Microsoft's "advice" to Intel to stop aiding cross-platform Java was backed by the threat of retaliation, and this conclusion is supported by the evidence cited above. Therefore we affirm the conclusion that Microsoft's threats to Intel were exclusionary, in violation of § 2 of the Sherman Act.

6. Course of Conduct

The District Court held that, apart from Microsoft's specific acts, Microsoft was liable under § 2 based upon its general "course of conduct." In reaching this conclusion the court relied upon *Continental Ore Co. v. Union Carbide & Carbon Corp.*, 370 U.S. 690, 699 (1962), where the Supreme Court stated, "[i]n [Sherman Act cases], plaintiffs should be given the full benefit of their proof without tightly compartmentalizing the various factual components and wiping the slate clean after scrutiny of each."

Microsoft points out that *Continental Ore* and the other cases cited by plaintiffs in support of "course of conduct" liability all involve conspiracies among multiple firms, not the conduct of a single firm; in that setting the "course of conduct" is the conspiracy itself, for which all the participants may be held liable. *See* Appellant's Opening Br. at 112–13. Plaintiffs respond that, as a policy matter, a monopolist's unilateral "campaign of [acts intended to exclude a rival] that in the aggregate has the requisite impact" warrants liability even if the acts viewed individually would be lawful for want of a significant effect upon competition. Appellees' Br. at 82–83.

We need not pass upon plaintiffs' argument, however, because the District Court did not point to any series of acts, each of which harms competition only slightly but the cumulative effect of which is significant enough to form an independent basis for liability. The "course of conduct" section of the District Court's opinion contains, with one exception, only broad, summarizing conclusions. *See, e.g., Conclusions of Law*, at 44 ("Microsoft placed an oppressive thumb on the scale of competitive fortune. . . ."). The only specific acts to which the court refers are Microsoft's expenditures in promoting its browser, *see id.* ("Microsoft has expended wealth and foresworn opportunities to realize more. . . ."), which we have explained are not in themselves unlawful. Because the District Court identifies no other specific acts as a basis for "course of conduct" liability, we reverse its conclusion that Microsoft's course of conduct separately violates § 2 of the Sherman Act.

C. Causation

As a final parry, Microsoft urges this court to reverse on the monopoly maintenance claim, because plaintiffs never established a causal link between Microsoft's anticompetitive conduct, in particular its foreclosure of Netscape's and Java's distribution channels, and the maintenance of Microsoft's operating system monopoly. *See Findings of Fact* ¶ 411 ("There is insufficient evidence to find that, absent Microsoft's actions, Navigator and Java already would have ignited genuine competition in the market for Intel-compatible PC operating systems."). This is the flip side of Microsoft's earlier argument that the District Court should have included middleware in the relevant market. According to Microsoft, the District Court cannot simultaneously find that middleware is not a reasonable substitute *and* that Microsoft's exclusionary conduct contributed to the maintenance of monopoly power in the operating system market. Microsoft claims that the first finding depended on the court's view that middleware does not pose a serious threat to Windows, *see supra* Section II.A, while the second finding required the court to find that Navigator and Java would have developed into serious enough cross-platform threats to erode the applications barrier to entry. We disagree.

Microsoft points to no case, and we can find none, standing for the proposition that, as to § 2 *liability* in an equitable enforcement action, plaintiffs must present direct proof that a defendant's continued monopoly power is precisely attributable to its anticompetitive conduct. As its lone authority, Microsoft cites the following passage from Professor Areeda's antitrust treatise: "The plaintiff has the burden of pleading, introducing evidence, and presumably proving by a preponderance of the evidence that reprehensible behavior has *contributed significantly* to the . . . maintenance of the monopoly." 3 PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW ¶ 650c, at 69 (1996) (emphasis added).

But, with respect to actions seeking injunctive relief, the authors of that treatise also recognize the need for courts to infer "causation" from the fact that a defendant has engaged in anticompetitive conduct that "reasonably appear[s] capable of making a significant contribution to . . . maintaining monopoly power." *Id.* ¶ 651c, at 78; *see also Morgan v. Ponder*, 892 F.2d 1355, 1363 (8th Cir. 1989); *Barry Wright*, 724 F.2d at 230. To require that § 2 liability turn on a plaintiff's ability or inability to reconstruct the hypothetical marketplace absent a defendant's anticompetitive conduct would only encourage monopolists to take more and earlier anticompetitive action.

We may infer causation when exclusionary conduct is aimed at producers of nascent competitive technologies as well as when it is aimed at producers of established substitutes. Admittedly, in the former case there is added uncertainty, inasmuch as nascent threats are merely *potential* substitutes. But the underlying proof problem is the same—neither plaintiffs nor the court can confidently reconstruct a product's hypothetical technological development in a world absent the defendant's exclusionary conduct. To some degree, "the defendant is made to suffer the uncertain consequences of its own undesirable conduct." 3 AREEDA & HOVENKAMP, ANTITRUST LAW ¶ 651c, at 78.

Given this rather edentulous test for causation, the question in this case is not whether Java or Navigator would actually have developed into viable platform substitutes, but (1) whether as a general matter the exclusion of nascent threats is the type of conduct that is reasonably capable of contributing significantly to a defendant's continued monopoly power and (2) whether Java and Navigator reasonably constituted nascent threats at the time Microsoft engaged in the anticompetitive conduct at issue. As to the first, suffice it to say that it would be inimical to the purpose of the Sherman Act to allow monopolists free reign to squash nascent, albeit unproven, competitors at will—particularly in industries marked by rapid technological advance and frequent paradigm shifts. *Findings of Fact* ¶ ¶ 59–60. As to the second, the District Court made ample findings that both Navigator and Java showed potential as middleware platform threats. *Findings of Fact* ¶ ¶ 68–77. Counsel for Microsoft admitted as much at oral argument. 02/26/01 Ct. Appeals Tr. at 27 ("There are no constraints on output. Marginal costs are essentially zero. And there are to some extent network effects. So a company like Netscape founded in 1994 can be by the middle of 1995 clearly a potentially lethal competitor to Windows because it can supplant its position in the market because of the characteristics of these markets.").

Microsoft's concerns over causation have more purchase in connection with the appropriate remedy issue, *i.e.*, whether the court should impose a structural remedy or merely enjoin the offensive conduct at issue. As we point out later in this opinion, divestiture is a remedy that is imposed only with great caution, in part because its long-term efficacy is rarely certain. *See infra* Section V.E. Absent some measure of confidence that there has been an actual loss to competition that needs to be restored, wisdom counsels against adopting radical structural relief. *See* 3 AREEDA & HOVENKAMP, ANTITRUST LAW ¶ 653b, at 91–92 ("[M]ore extensive equitable relief, particularly remedies such as divestiture designed to eliminate the monopoly altogether, raise more serious questions and require a clearer indication of a significant causal connection between the conduct and creation or maintenance of the market power."). But these queries go to questions of remedy, not liability. In short, causation affords Microsoft no defense to liability for its unlawful actions undertaken to maintain its monopoly in the operating system market.

III. Attempted Monopolization

Microsoft further challenges the District Court's determination of liability for "attempt[ing] to monopolize . . . any part of the trade or commerce among the several States." 15 U.S.C. § 2 (1997). To establish a § 2 violation for attempted monopolization, "a plaintiff must prove (1) that the defendant has engaged in predatory or anticompetitive conduct with (2) a specific intent to monopolize and (3) a dangerous probability of achieving monopoly power." *Spectrum Sports, Inc. v. McQuillan*, 506 U.S. 447, 456 (1993); *see also Times–Picayune Pub. Co. v. United States*, 345 U.S. 594, 626 (1953); *Lorain Journal Co. v. United States*, 342 U.S. 143, 153–55 (1951). Because a deficiency on any one of the three will defeat plaintiffs' claim, we look no further than plaintiffs' failure to prove a dangerous probability of achieving monopoly power in the putative browser market.

The determination whether a dangerous probability of success exists is a particularly fact-intensive inquiry. Because the Sherman Act does not identify the activities that constitute the offense of attempted monopolization, the court "must examine the facts of each case, mindful that the determination of what constitutes an attempt, as Justice Holmes explained, 'is a question of proximity and degree.' " *United States v. Am. Airlines, Inc.*, 743 F.2d 1114, 1118 (5th Cir. 1984) (quoting *Swift & Co. v. United States*, 196 U.S. 375, 402 (1904)). The District Court determined that "[t]he evidence supports the conclusion that Microsoft's actions did pose such a danger." *Conclusions of Law*, at 45. Specifically, the District Court concluded that "Netscape's assent to Microsoft's market division proposal would have, *instanter*, resulted in Microsoft's attainment of monopoly power in a second market," and that "the proposal itself created a dangerous probability of that result." *Conclusions of Law,* at 46 (citation omitted). The District Court further concluded that "the predatory course of conduct Microsoft has pursued since June of 1995 has revived the dangerous probability that Microsoft will attain monopoly power in a second market." *Id.*

At the outset we note a pervasive flaw in the District Court's and plaintiffs' discussion of attempted monopolization. Simply put, plaintiffs have made the same argument under two different headings—monopoly maintenance and attempted monopolization. They have relied upon Microsoft's § 2 liability for monopolization of the operating system market as a presumptive indicator of attempted monopolization of an entirely different market. The District Court implicitly accepted this approach: It agreed with plaintiffs that the events that formed the basis for the § 2 monopolization claim "warrant[ed] *additional* liability as an illegal attempt to amass monopoly power in 'the browser market.' " *Id.* at 45 (emphasis added). Thus, plaintiffs and the District Court failed to recognize the need for an analysis wholly independent of the conclusions and findings on monopoly maintenance.

To establish a dangerous probability of success, plaintiffs must as a threshold matter show that the browser market can be monopolized, *i.e.*, that a hypothetical monopolist in that market could enjoy market power. This, in turn, requires plaintiffs (1) to define the relevant market and (2) to demonstrate that substantial barriers to entry protect that market. Because plaintiffs have not carried their burden on either prong, we reverse without remand.

A. Relevant Market

A court's evaluation of an attempted monopolization claim must include a definition of the relevant market. *See Spectrum Sports*, 506 U.S. at 455–56. Such a definition establishes a context for evaluating the defendant's actions as well as for measuring whether the challenged conduct presented a dangerous probability of monopolization. *See id.* The District Court omitted this element of the *Spectrum Sports* inquiry.

Defining a market for an attempted monopolization claim involves the same steps as defining a market for a monopoly maintenance claim, namely a detailed description of the purpose of a browser—what functions may be included and what are not—and an examination of the substitutes that are part of the market and those that are not. *See also supra* Section II.A. The District Court never engaged in such an analysis nor entered detailed findings defining what a browser is or what products might constitute substitutes. In the Findings of Fact, the District Court (in a section on whether IE and Windows are separate products) stated only that "a Web browser provides the ability for the end user to select, retrieve, and perceive resources on the Web." *Findings of Fact* ¶ 150. Furthermore, in discussing attempted monopolization in its Conclusions of Law, the District Court failed to demonstrate analytical rigor when it employed varying and imprecise references to the "market for browsing technology for Windows," "the browser market," and "platform-level browsing software." *Conclusions of Law*, at 45.

Because the determination of a relevant market is a factual question to be resolved by the District Court, *see, e.g., All Care Nursing Serv., Inc. v. High Tech Staffing Servs., Inc.*, 135 F.3d 740, 749 (11th Cir. 1998); *Tunis Bros. Co., Inc. v. Ford Motor Co.*, 952 F.2d 715, 722–23 (3d Cir. 1991); *Westman Comm'n Co. v. Hobart Int'l, Inc.*, 796 F.2d 1216, 1220 (10th Cir. 1986), we would normally remand the case so that the District Court could formulate an appropriate definition. *See Pullman–Standard v. Swint*, 456 U.S. 273, 291–92 & n.22 (1982); *Janini v. Kuwait Univ.*, 43 F.3d 1534, 1537 (D.C. Cir. 1995); *Palmer v. Shultz*, 815 F.2d 84, 103 (D.C. Cir. 1987). A remand on market definition is unnecessary, however, because the District Court's imprecision is directly traceable to plaintiffs' failure to articulate and identify evidence before the District Court as to (1) what constitutes a browser (*i.e.*, what are the technological components of or functionalities provided by a browser) and (2) why certain other products are not reasonable substitutes (*e.g.*, browser shells or viewers for individual internet extensions, such as Real Audio Player or Adobe Acrobat Reader). *See* Plaintiffs' Joint Proposed Findings of Fact, at 817–19, *reprinted in* 2 J.A. at 1480–82; Plaintiffs' Joint Proposed Conclusions of Law § IV (No. 98–1232); *see also Lee v. Interstate Fire & Cas. Co.,* 86 F.3d 101, 105 (7th Cir. 1996) (stating that remand for development of a factual record is inappropriate where plaintiff failed to meet burden of persuasion and never suggested that additional evidence was necessary). Indeed, when plaintiffs in their Proposed Findings of Fact attempted to define a relevant market for the attempt claim, they pointed only to their separate products analysis for the tying claim. *See, e.g.,* Plaintiffs' Joint Proposed Findings of Fact, at 818, *reprinted in* 2 J.A. at 1481. However, the separate products analysis for tying purposes is not a substitute for the type of market definition that *Spectrum Sports* requires. *See infra* Section IV.A.

Plaintiffs' proposed findings and the District Court's actual findings on attempted monopolization pale in comparison to their counterparts on the monopoly maintenance claim. *Compare Findings of Fact* ¶ 150, *and* Plaintiffs' Joint Proposed Findings of Fact, at 817–819, *reprinted in* 2 J.A. at 1480–82, *with Findings of Fact* ¶ ¶ 18–66, *and* Plaintiffs' Joint Proposed Findings of Fact, at 20–31, *reprinted in* 1 J.A. at 658–69. Furthermore, in their brief and at oral argument before this court, plaintiffs did nothing to clarify or ameliorate this deficiency. *See, e.g.,* Appellees' Br. at 93–94.-

B. Barriers to Entry

Because a firm cannot possess monopoly power in a market unless that market is also protected by significant barriers to entry, *see supra* Section II.A, it follows that a firm cannot threaten to achieve monopoly power in a market unless that market is, or will be, similarly protected. *See Spectrum Sports*, 506 U.S. at 456 ("In order to determine whether there is a dangerous probability of monopolization, courts have found it necessary to consider . . . the defendant's ability to lessen or destroy competition in that market.") (citing cases). Plaintiffs have the burden of establishing barriers to entry into a properly defined relevant market. *See* 2A PHILLIP E. AREEDA ET AL., ANTITRUST LAW ¶ 420b, at 57–59 (1995); 3A PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW ¶ 807g, at 361–62 (1996); *see also Neumann v. Reinforced*

Earth Co., 786 F.2d 424, 429 (D.C. Cir. 1986). Plaintiffs must not only show that barriers to entry protect the properly defined browser market, but that those barriers are "significant." *See United States v. Baker Hughes Inc.*, 908 F.2d 981, 987 (D.C. Cir. 1990). Whether there are significant barriers to entry cannot, of course, be answered absent an appropriate market definition; thus, plaintiffs' failure on that score alone is dispositive. But even were we to assume a properly defined market, for example browsers consisting of a graphical interface plus internet protocols, plaintiffs nonetheless failed to carry their burden on barriers to entry.

Contrary to plaintiffs' contention on appeal, *see* Appellees' Br. at 91–93, none of the District Court's statements constitutes a finding of barriers to entry into the web browser market. Finding of Fact 89 states:

> At the time Microsoft presented its proposal, Navigator was the only browser product with a significant share of the market and thus the only one with the potential to weaken the applications barrier to entry. Thus, had it convinced Netscape to accept its offer of a "special relationship," Microsoft quickly would have gained such control over the extensions and standards that network-centric applications (including Web sites) employ as to make it all but impossible for any future browser rival to lure appreciable developer interest away from Microsoft's platform.

This finding is far too speculative to establish that competing browsers would be unable to enter the market, or that Microsoft would have the power to raise the price of its browser above, or reduce the quality of its browser below, the competitive level. Moreover, it is ambiguous insofar as it appears to focus on Microsoft's response to the perceived platform threat rather than the browser market. Finding of Fact 144, on which plaintiffs also rely, is part of the District Court's discussion of Microsoft's alleged anticompetitive actions to eliminate the platform threat posed by Netscape Navigator. This finding simply describes Microsoft's reliance on studies indicating consumers' reluctance to switch browsers, a reluctance not shown to be any more than that which stops consumers from switching brands of cereal. Absent more extensive and definitive factual findings, the District Court's legal conclusions about entry barriers amount to nothing more than speculation.

In contrast to their minimal effort on market definition, plaintiffs did at least offer proposed findings of fact suggesting that the possibility of network effects could potentially create barriers to entry into the browser market. *See* Plaintiffs' Joint Proposed Findings of Fact, at 822–23, 825–27, *reprinted in* 2 J.A. at 1485–86, 1488–90. The District Court did not adopt those proposed findings. *See Findings of Fact* ¶ 89. However, the District Court did acknowledge the possibility of a different kind of entry barrier in its Conclusions of Law:

> In the time it would have taken an aspiring entrant to launch a serious effort to compete against Internet Explorer, Microsoft *could have* erected the same type of barrier that protects its existing monopoly power by adding proprietary extensions to the browsing software under its control and by extracting commitments from OEMs, IAPs and others similar to the ones discussed in [the monopoly maintenance section].

Conclusions of Law, at 46 (emphasis added).

Giving plaintiffs and the District Court the benefit of the doubt, we might remand if the *possible existence* of entry barriers resulting from the *possible creation* and *exploitation* of network effects in the browser market were the only concern. That is not enough to carry the day, however, because the District Court did not make two key findings: (1) that network effects were a necessary or even probable, rather than merely possible, consequence of high market share in the browser market and (2) that a barrier to entry resulting from network effects would be "significant" enough to confer monopoly power. Again, these deficiencies are in large part traceable to plaintiffs' own failings. As to the first point, the District Court's use of the phrase "could have" reflects the same uncertainty articulated in testimony cited in plaintiffs' proposed findings. *See* Plaintiffs' Joint Proposed Findings of Fact, at 822 (citing testimony of Frederick Warren–Boulton), at 826 (citing testimony of Franklin Fisher), *reprinted in* 2 J.A. at 1485, 1489. As to the second point, the cited testimony in plaintiffs' proposed findings offers little more than conclusory statements. *See id.* at 822–27, *reprinted in* 2 J.A. at 1485–90. The proffered testimony contains no evidence regarding the cost of "porting" websites to different browsers or the potentially different economic incentives facing ICPs, as opposed to ISVs, in their decision to incur costs to do so. Simply invoking the phrase "network effects" without pointing to more evidence does not suffice to carry plaintiffs' burden in this respect.

Any doubt that we may have had regarding remand instead of outright reversal on the barriers to entry question was dispelled by plaintiffs' arguments on attempted monopolization before this court. Not only did plaintiffs fail to articulate a website barrier to entry *theory* in either their brief or at oral argument, they failed to point the court to evidence in the record that would support a finding that Microsoft would *likely* erect *significant* barriers to entry upon acquisition of a dominant market share.

Plaintiffs did not devote the same resources to the attempted monopolization claim as they did to the monopoly maintenance claim. But both claims require evidentiary and theoretical rigor. Because plaintiffs failed to make their case on attempted monopolization both in the District Court and before this court, there is no reason to give them a second chance to flesh out a claim that should have been fleshed out the first time around. Accordingly, we reverse the District Court's determination of § 2 liability for attempted monopolization.

IV. TYING

Microsoft also contests the District Court's determination of liability under § 1 of the Sherman Act. The District Court concluded that Microsoft's contractual and technological bundling of the IE web browser (the "tied" product) with its Windows operating system ("OS") (the "tying" product) resulted in a tying arrangement that was per se unlawful. *Conclusions of Law,* at 47–51. We hold that the rule of reason, rather than per se analysis, should govern the legality of tying arrangements involving platform software products. The Supreme Court has warned that " '[i]t is only after considerable experience with certain business relationships that courts classify them as *per se* violations. . . .' " *Broad. Music, Inc. v. CBS*, 441 U.S. 1, 9 (1979) (quoting *United States v. Topco Assocs.*, 405 U.S. 596, 607–08 (1972)). While every "business relationship" will in some sense have unique features, some represent entire, novel categories of dealings. As we shall explain, the arrangement before us is an example of the latter, offering the first up-close look at the technological integration of added functionality into software that serves as a platform for third-party applications. There being no close parallel in prior antitrust cases, simplistic application of per se tying rules carries a serious risk of harm. Accordingly, we vacate the District Court's finding of a per se tying violation and remand the case. Plaintiffs may on remand pursue their tying claim under the rule of reason.

The facts underlying the tying allegation substantially overlap with those set forth in Section II.B in connection with the § 2 monopoly maintenance claim. The key District Court findings are that (1) Microsoft required licensees of Windows 95 and 98 also to license IE as a bundle at a single price, *Findings of Fact* ¶¶ 137, 155, 158; (2) Microsoft refused to allow OEMs to uninstall or remove IE from the Windows desktop, *id.* ¶¶ 158, 203, 213; (3) Microsoft designed Windows 98 in a way that withheld from consumers the ability to remove IE by use of the Add/Remove Programs utility, *id.* ¶ 170; *cf. id.* ¶ 165 (stating that IE was subject to Add/Remove Programs utility in Windows 95); and (4) Microsoft designed Windows 98 to override the user's choice of default web browser in certain circumstances, *id.* ¶¶ 171, 172. The court found that these acts constituted a per se tying violation. *Conclusions of Law*, at 47–51. Although the District Court also found that Microsoft commingled operating system-only and browser-only routines in the same library files, *Findings of Fact* ¶ ¶ 161, 164, it did not include this as a basis for tying liability despite plaintiffs' request that it do so, Plaintiffs' Proposed Findings of Fact, ¶ ¶ 131–32, *reprinted in* 2 J.A. at 941–47.

There are four elements to a per se tying violation: (1) the tying and tied goods are two separate products; (2) the defendant has market power in the tying product market; (3) the defendant affords consumers no choice but to purchase the tied product from it; and (4) the tying arrangement forecloses a substantial volume of commerce. *See Eastman Kodak Co. v. Image Tech. Servs., Inc.*, 504 U.S. 451, 461–62 (1992); *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 12–18 (1984).

Microsoft does not dispute that it bound Windows and IE in the four ways the District Court cited. Instead it argues that Windows (the tying good) and IE browsers (the tied good) are not "separate products," Appellant's Opening Br. at 69–79, and that it did not substantially foreclose competing browsers from the tied product market, *id.* at 79–83. (Microsoft also contends that it does not have monopoly power in the tying product market, *id.* at 84–96, but, for reasons given in Section II.A, we uphold the District Court's finding to the contrary.)

We first address the separate-products inquiry, a source of much argument between the parties and of confusion in the cases. Our purpose is to highlight the poor fit between the separate-products test and the facts of this case. We then offer further reasons for carving an exception to the per se rule when the tying product is platform software. In the final section we discuss the District Court's inquiry if plaintiffs pursue a rule of reason claim on remand.

A. Separate-Products Inquiry Under the Per Se Test

The requirement that a practice involve two separate products before being condemned as an illegal tie started as a purely linguistic requirement: unless products are separate, one cannot be "tied" to the other. Indeed, the nature of the products involved in early tying cases—intuitively distinct items such as a movie projector and a film, *Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502 (1917)—led courts either to disregard the separate-products question, *see*, *e.g.*, *United Shoe Mach. Corp. v. United States*, 258 U.S. 451 (1922), or to discuss it only in passing, *see, e.g.*, *Motion Picture Patents*, 243 U.S. at 508, 512, 518. It was not until *Times-Picayune Publishing Co. v. United States*, 345 U.S. 594 (1953), that the separate-products issue became a distinct element of the test for an illegal tie. *Id.* at 614. Even that case engaged in a rather cursory inquiry into whether ads sold in the morning edition of a paper were a separate product from ads sold in the evening edition.

The first case to give content to the separate-products test was *Jefferson Parish*, 466 U.S. 2. That case addressed a tying arrangement in which a hospital conditioned surgical care at its facility on the purchase of anesthesiological services from an affiliated medical group. The facts were a challenge for casual separate-products analysis because the tied service—anesthesia—was neither intuitively distinct from nor intuitively contained within the tying service—surgical care. A further complication was that, soon after the Court enunciated the per se rule for tying liability in *International Salt Co. v. United States*, 332 U.S. 392, 396 (1947), and *Northern Pacific Railway Co. v. United States*, 356 U.S. 1, 5–7 (1958), new economic research began to cast doubt on the assumption, voiced by the Court when it established the rule, that " 'tying agreements serve hardly any purpose beyond the suppression of competition,' " *id.* at 6 (quoting *Standard Oil of Cal. v. United States*, 337 U.S. 293, 305–06 (1949)); *see also Jefferson Parish*, 466 U.S. at 15 n.23 (citing materials); *Fortner Enters. v. U.S. Steel Corp.*, 394 U.S. 495, 524–25 (1969) (Fortas, J., dissenting) ("*Fortner I*").

The *Jefferson Parish* Court resolved the matter in two steps. First, it clarified that "the answer to the question whether one or two products are involved" does not turn "on the functional relation between them. . . ." *Jefferson Parish*, 466 U.S. at 19; *see also id.* at 19 n.30. In other words, the mere fact that two items are complements, that "one . . . is useless without the other," *id.*, does not make them a single "product" for purposes of tying law. *Accord Eastman Kodak*, 504 U.S. at 463. Second, reasoning that the "definitional question [whether two distinguishable products are involved] depends on whether the arrangement may have the type of competitive consequences addressed by the rule [against tying]," *Jefferson Parish*, 466 U.S. at 21, the Court decreed that "no tying arrangement can exist unless there is a sufficient *demand* for the purchase of anesthesiological services separate from hospital services to identify a distinct product market in which it is *efficient* to offer anesthesiological services separately from hospital service," *id.* at 21–22 (emphasis added); *accord Eastman Kodak*, 504 U.S. at 462.

The Court proceeded to examine direct and indirect evidence of consumer demand for the tied product separate from the tying product. Direct evidence addresses the question whether, when given a choice, consumers purchase the tied good from the tying good maker, or from other firms. The Court took note, for example, of testimony that patients and surgeons often requested specific anesthesiologists not associated with a hospital. *Jefferson Parish*, 466 U.S. at 22. Indirect evidence includes the behavior of firms without market power in the tying good market, presumably on the notion that (competitive) supply follows demand. If competitive firms always bundle the tying and tied goods, then they are a single product. *See id.* at 22 n.36; *see also Eastman Kodak*, 504 U.S. at 462; *Fortner I*, 394 U.S. at 525 (Fortas, J., dissenting), *cited in Jefferson Parish*, 466 U.S. at 12, 22 n.35; *United States v. Jerrold Elecs. Corp.*, 187 F. Supp. 545, 559 (E.D. Pa. 1960), *aff'd per curiam*, 365 U.S. 567 (1961); 10 PHILLIP E. AREEDA ET AL., ANTITRUST LAW ¶ 1744, at 197–201 (1996). Here the Court noted that only 27% of anesthesiologists in markets other than the defendant's had financial relationships with hospitals, and that, unlike radiologists and pathologists, anesthesiologists were not usually employed by hospitals, *i.e.*, bundled with hospital services. *Jefferson Parish*, 466 U.S. at 22 n.36. With both direct and indirect evidence concurring, the Court determined that hospital surgery and anesthesiological services were distinct goods.

To understand the logic behind the Court's consumer demand test, consider first the postulated harms from tying. The core concern is that tying prevents goods from competing directly for consumer choice on their merits, *i.e.*, being selected as a result of "buyers' independent judgment," *id.* at 13 (internal quotes omitted). With a tie, a buyer's "freedom to select the best bargain in the second market [could be] impaired by his need to purchase the tying product, and perhaps by an inability to evaluate the true cost of either product. . . ." *Id.* at 15. Direct competition on the merits of the tied product is foreclosed when the tying product either is sold only in a bundle with the tied product or, though offered separately, is sold at a bundled price, so that the buyer pays the same price whether he takes the tied product or not. In both cases, a consumer buying the tying product becomes entitled to the tied product; he will therefore likely be unwilling to buy a competitor's version of the tied product even if, making his own price/quality assessment, that is what he would prefer.

But not all ties are bad. Bundling obviously saves distribution and consumer transaction costs. 9 PHILLIP E. AREEDA, ANTITRUST LAW ¶ 1703g2, at 51–52 (1991). This is likely to be true, to take some examples from the computer industry, with the integration of math co-processors and memory into microprocessor chips and the inclusion of spell checkers in word processors. 11/10/98 pm Tr. at 18–19 (trial testimony of Steven McGeady of Intel), *reprinted in* 9 J.A. at 5581–82 (math co-processor); *Cal. Computer Prods., Inc. v. IBM Corp.*, 613 F.2d 727, 744 & n.29 (9th Cir. 1979) (memory). Bundling can also capitalize on certain economies of scope. A possible example is the "shared" library files that perform OS and browser functions with the very same lines of code and thus may save drive space from the clutter of redundant routines and memory when consumers use both the OS and browser simultaneously. 11/16/98 pm Tr. at 44 (trial testimony of Glenn Weadock), *reprinted in* 9 J.A. at 5892; Direct Testimony of Microsoft's James Allchin ¶ ¶ 10, 97, 100, 106–

116, app. A (excluding ¶ ¶ f, g.vi), *reprinted in* 5 J.A. at 3292, 3322–30, 3412–17. Indeed, if there were no efficiencies from a tie (including economizing on consumer transaction costs such as the time and effort involved in choice), we would expect distinct consumer demand for each individual component of every good. In a competitive market with zero transaction costs, the computers on which this opinion was written would only be sold piecemeal—keyboard, monitor, mouse, central processing unit, disk drive, and memory all sold in separate transactions and likely by different manufacturers.

Recognizing the potential benefits from tying, *see Jefferson Parish*, 466 U.S. at 21 n.33, the Court in *Jefferson Parish* forged a separate-products test that, like those of market power and substantial foreclosure, attempts to screen out false positives under per se analysis. The consumer demand test is a rough proxy for whether a tying arrangement may, on balance, be welfare-enhancing, and unsuited to per se condemnation. In the abstract, of course, there is always direct separate demand for products: assuming choice is available at zero cost, consumers will prefer it to no choice. Only when the efficiencies from bundling are dominated by the benefits to choice for enough consumers, however, will we actually observe consumers making independent purchases. In other words, perceptible separate demand is inversely proportional to net efficiencies. On the supply side, firms without market power will bundle two goods only when the cost savings from joint sale outweigh the value consumers place on separate choice. So bundling by all competitive firms implies strong net efficiencies. If a court finds either that there is no noticeable separate demand for the tied product or, there being no convincing direct evidence of separate demand, that the entire "competitive fringe" engages in the same behavior as the defendant, 10 AREEDA ET AL., ANTITRUST LAW ¶ 1744c4, at 200, then the tying and tied products should be declared one product and per se liability should be rejected.

Before concluding our exegesis of *Jefferson Parish*'s separate-products test, we should clarify two things. First, *Jefferson Parish* does not endorse a direct inquiry into the efficiencies of a bundle. Rather, it proposes easy-to-administer proxies for net efficiency. In describing the separate-products test we discuss efficiencies only to explain the rationale behind the consumer demand inquiry. To allow the separate-products test to become a detailed inquiry into possible welfare consequences would turn a screening test into the very process it is expected to render unnecessary. 10 AREEDA ET AL., ANTITRUST LAW ¶ ¶ 1741b & c, at 180–85; *see also Jefferson Parish*, 466 U.S. at 34–35 (O'Connor, J., concurring).

Second, the separate-products test is not a one-sided inquiry into the cost savings from a bundle. Although *Jefferson Parish* acknowledged that prior lower court cases looked at cost-savings to decide separate products, *see id.* at 22 n.35, the Court conspicuously did not adopt that approach in its disposition of tying arrangement before it. Instead it chose proxies that balance costs savings against reduction in consumer choice.

With this background, we now turn to the separate-products inquiry before us. The District Court found that many consumers, if given the option, would choose their browser separately from the OS. *Findings of Fact* ¶ 151 (noting that "corporate consumers . . . prefer to standardize on the same browser across different [OSs]" at the workplace). Turning to industry custom, the court found that, although all major OS vendors bundled browsers with their OSs, these companies either sold versions without a browser, or allowed OEMs or end-users either not to install the bundled browser or in any event to "uninstall" it. *Id.* ¶ 153. The court did not discuss the record evidence as to whether OS vendors other than Microsoft sold at a bundled price, with no discount for a browserless OS, perhaps because the record evidence on the issue was in conflict. *Compare, e.g.*, Direct Testimony of Richard Schmalensee ¶ 241, *reprinted in* 7 J.A. at 4315 ("[A]ll major operating system vendors do in fact include Web-browsing software with the operating system at *no extra charge*.") (emphasis added), *with, e.g.*, 1/6/99 pm Tr. at 42 (trial testimony of Franklin Fisher of MIT) (suggesting all OSs but Microsoft offer discounts).

Microsoft does not dispute that many consumers demand alternative browsers. But on industry custom Microsoft contends that no other firm requires non-removal because no other firm has invested the resources to integrate web browsing as deeply into its OS as Microsoft has. Appellant's Opening Br. at 25; *cf.* Direct Testimony of James Allchin ¶ ¶ 262–72, *reprinted in* 5 J.A. at 3385–89 (Apple, IBM); 11/5/98 pm Tr. at 55–58 (trial testimony of Apple's Avadis Tevanian, Jr.), *reprinted in* 9 J.A. at 5507–10 (Apple). (We here use the term "integrate" in the rather simple sense of converting individual goods into components of a single physical object (*e.g.*, a computer as it leaves the OEM, or a disk or sets of disks), without any normative implication that such integration is desirable or achieves special advantages. *Cf. United States v. Microsoft Corp.*, 147 F.3d 935, 950 (D.C. Cir. 1998) ("*Microsoft II*").) Microsoft contends not only that its integration of IE into Windows is innovative and beneficial but also that it requires non-removal of IE. In our discussion of monopoly maintenance we find that these claims fail the efficiency balancing applicable in that context. But the separate-products analysis is supposed to perform its function as a proxy *without* embarking on any direct analysis of efficiency. Accordingly, Microsoft's implicit argument—that in this case looking to a competitive fringe is inadequate to evaluate fully its potentially innovative technological integration, that such a comparison is between apples and oranges—poses a legitimate objection to the operation of *Jefferson Parish*'s separate-products test for the per se rule.

In fact there is merit to Microsoft's broader argument that *Jefferson Parish*'s consumer demand test would "chill innovation to the detriment of consumers by preventing firms from integrating into their products new functionality previously provided by standalone products—and hence, by definition, subject to separate consumer demand." Appellant's Opening Br. at 69. The per se rule's direct consumer demand and indirect industry custom inquiries are, as a general matter, backward-looking and therefore systematically poor proxies for overall efficiency in the presence of new and innovative integration. *See* 10 AREEDA ET AL., ANTITRUST LAW ¶ 1746, at 224–29; Amicus Brief of Lawrence Lessig at 24–25, and sources cited therein (brief submitted regarding Conclusions of Law). The direct consumer demand test focuses on historic consumer behavior, likely before integration, and the indirect industry custom test looks at firms that, unlike the defendant, may not have integrated the tying and tied goods. Both tests compare incomparables—the defendant's decision to bundle in the presence of integration, on the one hand, and consumer and competitor calculations in its absence, on the other. If integration has efficiency benefits, these may be ignored by the *Jefferson Parish* proxies. Because one cannot be sure beneficial integration will be protected by the other elements of the per se rule, simple application of that rule's separate-products test may make consumers worse off.

In light of the monopoly maintenance section, obviously, we do not find that Microsoft's integration is welfare-enhancing or that it should be absolved of tying liability. Rather, we heed Microsoft's warning that the separate-products element of the per se rule may not give newly integrated products a fair shake.

B. Per Se Analysis Inappropriate for this Case.

We now address directly the larger question as we see it: whether standard per se analysis should be applied "off the shelf" to evaluate the defendant's tying arrangement, one which involves software that serves as a platform for third-party applications. There is no doubt that "[i]t is far too late in the history of our antitrust jurisprudence to question the proposition that *certain* tying arrangements pose an unacceptable risk of stifling competition and therefore are unreasonable '*per se*.' " *Jefferson Parish*, 466 U.S. at 9 (emphasis added). But there are strong reasons to doubt that the integration of additional software functionality into an OS falls among these arrangements. Applying per se analysis to such an amalgamation creates undue risks of error and of deterring welfare-enhancing innovation.

The Supreme Court has warned that " '[i]t is only after considerable experience with certain business relationships that courts classify them as *per se* violations. . . .' " *Broad. Music*, 441 U.S. at 9 (quoting *Topco Assocs.*, 405 U.S. at 607–08); *accord Cont'l T.V., Inc. v. GTE Sylvania Inc.*, 433 U.S. 36, 47–59 (1977); *White Motor Co. v. United States*, 372 U.S. 253, 263 (1963); *Jerrold Elecs.*, 187 F. Supp. at 555–58, 560–61; *see also* Frank H. Easterbrook, *Allocating Antitrust Decisionmaking Tasks*, 76 GEO. L.J. 305, 308 (1987). Yet the sort of tying arrangement attacked here is unlike any the Supreme Court has considered. The early Supreme Court cases on tying dealt with arrangements whereby the sale or lease of a patented product was conditioned on the purchase of certain unpatented products from the patentee. *See Motion Picture Patents*, 243 U.S. 502 (1917); *United Shoe Mach.*, 258 U.S. 451 (1922); *IBM Corp. v. United States*, 298 U.S. 131 (1936); *Int'l Salt*, 332 U.S. 392 (1947). Later Supreme Court tying cases did not involve market power derived from patents, but continued to involve contractual ties. *See Times–Picayune*, 345 U.S. 594 (1953) (defendant newspaper conditioned the purchase of ads in its evening edition on the purchase of ads in its morning edition); *N. Pac. Ry.*, 356 U.S. 1 (1958) (defendant railroad leased land only on the condition that products manufactured on the land be shipped on its railways); *United States v. Loew's Inc.*, 371 U.S. 38 (1962) (defendant distributor of copyrighted feature films conditioned the sale of desired films on the purchase of undesired films); *U.S. Steel Corp. v. Fortner Enters., Inc.*, 429 U.S. 610 (1977) ("*Fortner II*") (defendant steel company conditioned access to low interest loans on the purchase of the defendant's prefabricated homes); *Jefferson Parish*, 466 U.S. 2 (1984) (defendant hospital conditioned use of its operating rooms on the purchase of anesthesiological services from a medical group associated with the hospital); *Eastman Kodak*, 504 U.S. 451 (1992) (defendant photocopying machine manufacturer conditioned the sale of replacement parts for its machines on the use of the defendant's repair services).

In none of these cases was the tied good physically and technologically integrated with the tying good. Nor did the defendants ever argue that their tie improved the value of the tying product to users *and* to makers of complementary goods. In those cases where the defendant claimed that use of the tied good made the tying good more valuable to users, the Court ruled that the same result could be achieved via quality standards for substitutes of the tied good. *See, e.g.*, *Int'l Salt*, 332 U.S. at 397–98; *IBM*, 298 U.S. at 138–40. Here Microsoft argues that IE and Windows are an integrated physical product and that the bundling of IE APIs with Windows makes the latter a better applications platform for third-party software. It is unclear how the benefits from IE APIs could be achieved by quality standards for different browser manufacturers. We do not pass judgment on Microsoft's claims regarding the benefits from integration of its APIs. We merely note that these and other novel, purported efficiencies suggest that judicial "experience" provides little basis for believing that, "because of their pernicious effect on competition and lack of *any* redeeming virtue," a software firm's decisions to sell multiple functionalities as a package should be "conclusively presumed to be unreasonable and therefore illegal without elaborate inquiry as to the precise harm they have caused or the business excuse for their use." *N. Pac. Ry.*, 356 U.S. at 5 (emphasis added).

Nor have we found much insight into software integration among the decisions of lower federal courts. Most tying cases in the computer industry involve bundling with hardware. *See*, *e.g.*, *Digital Equip. Corp. v. Uniq Digital Techs., Inc.*, 73 F.3d 756, 761 (7th Cir. 1996) (Easterbrook, J.) (rejecting with little discussion the notion that bundling of OS with a computer is a tie of two separate products); *Datagate, Inc. v. Hewlett–Packard Co.*, 941 F.2d 864, 870 (9th Cir. 1991) (holding that plaintiff's allegation that defendant conditioned its software on purchase of its hardware was sufficient to survive summary judgment); *Digidyne Corp. v. Data Gen. Corp.*, 734 F.2d 1336, 1341–47 (9th Cir. 1984) (holding that defendant's conditioning the sale of its OS on the purchase of its CPU constitutes a per se tying violation); *Cal. Computer*

Prods., 613 F.2d at 743–44 (holding that defendant's integration into its CPU of a disk controller designed for its own disk drives was a useful innovation and not an impermissible attempt to monopolize); *ILC Peripherals Leasing Corp. v. IBM Corp.*, 448 F. Supp. 228, 233 (N.D. Cal. 1978) (finding that defendant's integration of magnetic disks and a head/disk assembly was not an unlawful tie), *aff'd per curiam sub. nom. Memorex Corp. v. IBM Corp.*, 636 F.2d 1188 (9th Cir. 1980); *see also Transamerica Computer Co. v. IBM Corp.*, 698 F.2d 1377, 1382–83 (9th Cir. 1983) (finding lawful defendant's design changes that rendered plaintiff peripheral maker's tape drives incompatible with the defendant's CPU). The hardware case that most resembles the present one is *Telex Corp. v. IBM Corp.*, 367 F. Supp. 258 (N.D. Okla. 1973), *rev'd on other grounds*, 510 F.2d 894 (10th Cir. 1975). Just as Microsoft integrated web browsing into its OS, IBM in the 1970s integrated memory into its CPUs, a hardware platform. A peripheral manufacturer alleged a tying violation, but the District Court dismissed the claim because it thought it inappropriate to enmesh the courts in product design decisions. *Id.* at 347. The court's discussion of the tying claim was brief and did not dwell on the effects of the integration on competition or efficiencies. Nor did the court consider whether per se analysis of the alleged tie was wise.

We have found four antitrust cases involving arrangements in which a software program is tied to the purchase of a software platform—two district court cases and two appellate court cases, including one from this court. The first case, *Innovation Data Processing, Inc. v. IBM Corp.*, 585 F. Supp. 1470 (D.N.J. 1984), involved an allegation that IBM bundled with its OS a utility used to transfer data from a tape drive to a computer's disk drive. Although the court mentioned the efficiencies achieved by bundling, it ultimately dismissed the per se tying claim because IBM sold a discounted version of the OS without the utility. *Id.* at 1475–76. The second case, *A.I. Root Co. v. Computer/Dynamics, Inc.*, 806 F.2d 673 (6th Cir. 1986), was brought by a business customer who claimed that an OS manufacturer illegally conditioned the sale of its OS on the purchase of other software applications. The court quickly disposed of the case on the ground that defendant Computer/Dynamics had no market power. *Id.* at 675–77. There was no mention of the efficiencies from the tie. The third case, *Caldera, Inc. v. Microsoft Corp.*, 72 F. Supp. 2d 1295 (D. Utah 1999), involved a complaint that the technological integration of MS–DOS and Windows 3.1 into Windows 95 constituted a per se tying violation. The court formulated the "single product" issue in terms of whether the tie constituted a technological improvement, ultimately concluding that Microsoft was not entitled to summary judgment on that issue. *Id.* at 1322–28.

The software case that bears the greatest resemblance to that at bar is, not surprisingly, *Microsoft II*, 147 F.3d 935, where we examined the bundling of IE with Windows 95. But the issue there was whether the bundle constituted an "integrated product" as the term was used in a 1994 consent decree between the Department of Justice and Microsoft. *Id.* at 939. We did not consider whether Microsoft's bundling should be condemned as per se illegal. We certainly did not make any finding that bundling IE with Windows had "no purpose except stifling of competition," *White Motor*, 372 U.S. at 263, an important consideration in defining the scope of any of antitrust law's per se rules, *see Cont'l T.V.*, 433 U.S. at 57–59. While we believed our interpretation of the term "integrated product" was consistent with the test for separate products under tying law, we made clear that the "antitrust question is of course distinct." *Microsoft II*, 147 F.3d at 950 n.14. We even cautioned that our conclusion that IE and Windows 95 were integrated was "subject to reexamination on a more complete record." *Id.* at 952. To the extent that the decision completely disclaimed judicial capacity to evaluate "high-tech product design," *id.*, it cannot be said to conform to prevailing antitrust doctrine (as opposed to resolution of the decree-interpretation issue then before us). In any case, mere review of asserted breaches of a consent decree hardly constitutes enough "experience" to warrant application of per se analysis. *See Broad. Music*, 441 U.S. at 10–16 (refusing to apply per se analysis to defendant's blanket licenses even though those licenses had been thoroughly investigated by the Department of Justice and were the subject of a consent decree that had been reviewed by numerous courts).

While the paucity of cases examining software bundling suggests a high risk that per se analysis may produce inaccurate results, the nature of the platform software market affirmatively suggests that per se rules might stunt valuable innovation. We have in mind two reasons.

First, as we explained in the previous section, the separate-products test is a poor proxy for net efficiency from newly integrated products. Under per se analysis the first firm to merge previously distinct functionalities (*e.g.*, the inclusion of starter motors in automobiles) or to eliminate entirely the need for a second function (*e.g.*, the invention of the stain-resistant carpet) risks being condemned as having tied two separate products because at the moment of integration there will appear to be a robust "distinct" market for the tied product. *See* 10 AREEDA ET AL., ANTITRUST LAW ¶ 1746, at 224. Rule of reason analysis, however, affords the first mover an opportunity to demonstrate that an efficiency gain from its "tie" adequately offsets any distortion of consumer choice. *See Grappone, Inc. v. Subaru of New England, Inc.*, 858 F.2d 792, 799 (1st Cir. 1988) (Breyer, J.); *see also Town Sound & Custom Tops, Inc. v. Chrysler Motor Corp.*, 959 F.2d 468, 482 (3d Cir. 1992); *Kaiser Aluminum & Chem. Sales, Inc. v. Avondale Shipyards, Inc.*, 677 F.2d 1045, 1048–49 n.5 (5th Cir. 1982).

The failure of the separate-products test to screen out certain cases of productive integration is particularly troubling in platform software markets such as that in which the defendant competes. Not only is integration common in such markets, but it is common among firms without market power. We have already reviewed evidence that nearly all competitive OS vendors also bundle browsers. Moreover, plaintiffs do not dispute that OS vendors can and do incorporate basic internet plumbing and other useful functionality into their OSs. *See* Direct Testimony of Richard Schmalensee ¶ 508, *reprinted in* 7 J.A. at 4462–64 (disk defragmentation, memory management, peer-to-peer networking or file sharing); 11/19/98 am Tr. at 82–83 (trial testimony of Frederick Warren–Boulton), *reprinted in* 10 J.A. at 6427–28 (TCP/IP stacks). Firms without market power have no incentive to package different pieces of software together unless there are efficiency gains from doing so. The ubiquity of bundling in competitive platform software markets should give courts reason to pause before condemning such behavior in less competitive markets.

Second, because of the pervasively innovative character of platform software markets, tying in such markets may produce efficiencies that courts have not previously encountered and thus the Supreme Court had not factored into the per se rule as originally conceived. For example, the bundling of a browser with OSs enables an independent software developer to count on the presence of the browser's APIs, if any, on consumers' machines and thus to omit them from its own package. *See* Direct Testimony of Richard Schmalensee ¶ ¶ 230–31, 234, *reprinted* in 7 J.A. at 4309–11, 4312; Direct Testimony of Michael Devlin ¶ ¶ 12–21, *reprinted in* 5 J.A. at 3525–29; *see also Findings of Fact* ¶ 2. It is true that software developers can bundle the browser APIs they need with their own products, *see id.* ¶ 193, but that may force consumers to pay twice for the same API if it is bundled with two different software programs. It is also true that OEMs can include APIs with the computers they sell, *id.*, but diffusion of uniform APIs by that route may be inferior. First, many OEMs serve special subsets of Windows consumers, such as home or corporate or academic users. If just one of these OEMs decides not to bundle an API because it does not benefit enough of its clients, ISVs that use that API might have to bundle it with every copy of their program. Second, there may be a substantial lag before all OEMs bundle the same set of APIs—a lag inevitably aggravated by the first phenomenon. In a field where programs change very rapidly, delays in the spread of a necessary element (here, the APIs) may be very costly. Of course, these arguments may not justify Microsoft's decision to bundle APIs in this case, particularly because Microsoft did not merely bundle with Windows the APIs from IE, but an entire browser application (sometimes even without APIs, *see id.*).

A justification for bundling a component of software may not be one for bundling the entire software package, especially given the malleability of software code. *See id.* ¶ ¶ 162–63; 12/9/98 am Tr. at 17 (trial testimony of David Farber); 1/6/99 am Tr. at 6–7 (trial testimony of Franklin Fisher), *reprinted in* 11 J.A. at 7192–93; Direct Testimony of Joachim Kempin ¶ 286, *reprinted in* 6 J.A. at 3749. Furthermore, the interest in efficient API diffusion obviously supplies a far stronger justification for simple price-bundling than for Microsoft's contractual or technological bars to subsequent *removal* of functionality. But our qualms about redefining the boundaries of a defendant's product and the possibility of consumer gains from simplifying the work of applications developers makes us question any hard and fast approach to tying in OS software markets.

There may also be a number of efficiencies that, although very real, have been ignored in the calculations underlying the adoption of a per se rule for tying. We fear that these efficiencies are common in technologically dynamic markets where product development is especially unlikely to follow an easily foreseen linear pattern. Take the following example from *ILC Peripherals*, 448 F. Supp. 228, a case concerning the evolution of disk drives for computers. When IBM first introduced such drives in 1956, it sold an integrated product that contained magnetic disks and disk heads that read and wrote data onto disks. *Id.* at 231. Consumers of the drives demanded two functions—to store data and to access it all at once. In the first few years consumers' demand for storage increased rapidly, outpacing the evolution of magnetic disk technology. To satisfy that demand IBM made it possible for consumers to remove the magnetic disks from drives, even though that meant consumers would not have access to data on disks removed from the drive. This componentization enabled makers of computer peripherals to sell consumers removable disks. *Id.* at 231–32. Over time, however, the technology of magnetic disks caught up with demand for capacity, so that consumers needed few removable disks to store all their data. At this point IBM reintegrated disks into their drives, enabling consumers to once again have immediate access to all their data without a sacrifice in capacity. *Id.* A manufacturer of removable disks sued. But the District Court found the tie justified because it satisfied consumer demand for immediate access to all data, and ruled that disks and disk heads were one product. *Id.* at 233. A court hewing more closely to the truncated analysis contemplated by *Northern Pacific Railway* would perhaps have overlooked these consumer benefits.

These arguments all point to one conclusion: we cannot comfortably say that bundling in platform software markets has so little "redeeming virtue," *N. Pac. Ry.*, 356 U.S. at 5, and that there would be so "very little loss to society" from its ban, that "an inquiry into its costs in the individual case [can be] considered [ ] unnecessary." *Jefferson Parish*, 466 U.S. at 33–34 (O'Connor, J., concurring). We do not have enough empirical evidence regarding the effect of Microsoft's practice on the amount of consumer surplus created or consumer choice foreclosed by the integration of added functionality into platform software to exercise sensible judgment regarding that entire class of behavior. (For some issues we have no data.) "We need to know more than we do about the actual impact of these arrangements on competition to decide whether they . . . should be classified as *per se* violations of the Sherman Act." *White Motor*, 372 U.S. at 263. Until then, we will heed the wisdom that "easy labels do not always supply ready answers," *Broad. Music*, 441 U.S. at 8, and vacate the District Court's finding of per se tying liability under Sherman Act § 1. We remand the case for evaluation of Microsoft's tying arrangements under the rule of reason. *See Pullman–Standard v. Swint*, 456 U.S. 273, 292 (1982) ("[W]here findings are infirm because of an erroneous view of the law, a remand is the proper course unless the record permits only one resolution of the factual issue."). That rule more freely permits consideration of the benefits of bundling in software markets, particularly those for OSs, and a balancing of these benefits against the costs to consumers whose ability to make direct price/quality tradeoffs in the tied market may have been impaired. *See Jefferson Parish*, 466 U.S. at 25 nn.41–42 (noting that per se rule does not broadly permit consideration of procompetitive justifications); *id.* at 34–35 (O'Connor, J., concurring); *N. Pac. Ry.*, 356 U.S. at 5.

Our judgment regarding the comparative merits of the per se rule and the rule of reason is confined to the tying arrangement before us, where the tying product is software whose major purpose is to serve as a platform for third-party applications and the tied product is complementary software functionality. While our reasoning may at times appear to have broader force, we do not have the confidence to speak to facts outside the record, which contains scant discussion of software integration generally. Microsoft's primary justification for bundling IE APIs is that their inclusion with Windows increases the value of third-party software (and Windows) to consumers. *See* Appellant's Opening Br. at 41–43. Because this claim applies with distinct force when the tying product is *platform* software, we have no present basis for finding the per se rule inapplicable to software markets generally. Nor should we be interpreted as setting a precedent for switching to the rule of reason every time a court identifies an efficiency justification for a tying arrangement. Our reading of the record suggests merely that integration of new functionality into platform software is a common practice and that wooden application of per se rules in this litigation may cast a cloud over platform innovation in the market for PCs, network computers and information appliances.

C. On Remand

Should plaintiffs choose to pursue a tying claim under the rule of reason, we note the following for the benefit of the trial court:

First, on remand, plaintiffs must show that Microsoft's conduct unreasonably restrained competition. Meeting that burden "involves an inquiry into the actual effect" of Microsoft's conduct on competition in the tied good market, *Jefferson Parish*, 466 U.S. at 29, the putative market for browsers. To the extent that certain aspects of tying injury may depend on a careful definition of the tied good market and a showing of barriers to entry other than the tying arrangement itself, plaintiffs would have to establish these points. *See Jefferson Parish*, 466 U.S. at 29 ("This competition [among anesthesiologists] takes place in a market that has not been defined."); *id*. at 29 n.48 ("[N]either the District Court nor the Court of Appeals made any findings concerning the contract's effect on entry barriers."). But plaintiffs were required—and had every incentive—to provide both a definition of the browser market and barriers to entry to that market as part of their § 2 attempted monopolization claim; yet they failed to do so. *See supra* Section III. Accordingly, on remand of the § 1 tying claim, plaintiffs will be precluded from arguing any theory of harm that depends on a precise definition of browsers or barriers to entry (for example, network effects from Internet protocols and extensions embedded in a browser) other than what may be implicit in Microsoft's tying arrangement.

Of the harms left, plaintiffs must show that Microsoft's conduct was, on balance, anticompetitive. Microsoft may of course offer procompetitive justifications, and it is plaintiffs' burden to show that the anticompetitive effect of the conduct outweighs its benefit.

Second, the fact that we have already considered some of the behavior plaintiffs allege to constitute tying violations in the monopoly maintenance section does not resolve the § 1 inquiry. The two practices that plaintiffs have most ardently claimed as tying violations are, indeed, a basis for liability under plaintiffs' § 2 monopoly maintenance claim. These are Microsoft's refusal to allow OEMs to uninstall IE or remove it from the Windows desktop, *Findings of Fact* ¶ ¶ 158, 203, 213, and its removal of the IE entry from the Add/Remove Programs utility in Windows 98, *id.* ¶ 170. *See supra* Section II.B. In order for the District Court to conclude these practices also constitute § 1 tying violations, plaintiffs must demonstrate that their benefits—if any, *see supra* Sections II.B.1.b and II.B.2.b; *Findings of Fact* ¶ ¶ 176, 186, 193—are outweighed by the harms in the *tied product* market. *See Jefferson Parish*, 466 U.S. at 29. If the District Court is convinced of net harm, it must then consider whether any additional remedy is necessary.

In Section II.B we also considered another alleged tying violation—the Windows 98 override of a consumer's choice of default web browser. We concluded that this behavior does not provide a distinct basis for § 2 liability because plaintiffs failed to rebut Microsoft's proffered justification by demonstrating that harms in the operating system market outweigh Microsoft's claimed benefits. *See supra* Section II.B. On remand, however, although Microsoft may offer the same procompetitive justification for the override, plaintiffs must have a new opportunity to rebut this claim, by demonstrating that the anticompetitive effect in the *browser* market is greater than these benefits.

Finally, the District Court must also consider an alleged tying violation that we did not consider under § 2 monopoly maintenance: price bundling. First, the court must determine if Microsoft indeed price bundled—that is, was Microsoft's charge for Windows and IE higher than its charge would have been for Windows alone? This will require plaintiffs to resolve the tension between *Findings of Fact* ¶ ¶ 136–37, which Microsoft interprets as saying that no part of the bundled price of Windows can be attributed to IE, and *Conclusions of Law*, at 50, which says the opposite. *Compare* Direct Testimony of Paul Maritz ¶ ¶ 37, 296, *reprinted in* 6 J.A. at 3656, 3753–54 (Microsoft did not "charge separately" for IE, but like all other major OS vendors included browsing software at "no extra charge"), *with* GX 202 at MS7 004343, esp. 004347, *reprinted in* 22 J.A. at 14459, esp. 14463 (memo from Christian Wildfeuer describing focus group test used to price Windows 98 with IE 4), *and* GX 1371 at MS7 003729–30, 003746, 003748, esp. 003750, *reprinted in* 15 J.A. at 10306–07, 10323, 10325, esp. 10327 (Windows 98 pricing and marketing memo), *and Findings of Fact* ¶ 63 (identifying GX 202 as the *basis* for Windows 98 pricing).

If there is a positive price increment in Windows associated with IE (we know there is no claim of price predation), plaintiffs must demonstrate that the anticompetitive effects of Microsoft's price bundling outweigh any procompetitive justifications the company provides for it. In striking this balance, the District Court should consider, among other things, indirect evidence of efficiency provided by "the competitive fringe." *See supra* Section IV.A. Although this inquiry may overlap with the separate-products screen under the per se rule, that is not its role here. Because courts applying the rule of reason are free to look at both direct and indirect evidence of efficiencies from a tie, there is no need for a screening device as such; thus the separate-products inquiry serves merely to classify arrangements as subject to tying law, as opposed to, say, liability for exclusive dealing. *See Times–Picayune*, 345 U.S. at 614 (finding a single product and then turning to a general rule of reason analysis under § 1, though not using the term "tying"); *Foster v. Md. State Sav. & Loan Ass'n*, 590 F.2d 928, 931, 933 (D.C. Cir. 1978), *cited in Jefferson Parish*, 466 U.S. at 40 (O'Connor, J., concurring) (same); *see also Chawla v. Shell Oil Co.*, 75 F. Supp. 2d 626, 635, 643–44 (S.D. Tex. 1999) (considering a rule of reason tying claim after finding a single product under the per se rule); *Montgomery County Ass'n of Realtors v. Realty Photo Master Corp.*, 783 F. Supp. 952, 961 & n.26 (D. Md. 1992), *aff'd mem.* 993 F.2d 1538 (4th Cir. 1993) (same).

If OS vendors without market power also sell their software bundled with a browser, the natural inference is that sale of the items as a bundle serves consumer demand and that unbundled sale would not, for otherwise a competitor could profitably offer the two products separately and capture sales of the tying good from vendors that bundle. *See* 10 AREEDA ET AL., ANTITRUST LAW ¶ 1744b, at 197–98. It does appear that most if not all firms have sold a browser with their OSs at a bundled price, beginning with IBM and its OS/2 Warp OS in September 1994, *Findings of Fact* ¶ 140; *see also* Direct Testimony of Richard Schmalensee ¶ 212, *reprinted in* 7 J.A. at 4300–01, and running to current versions of Apple's Mac OS, Caldera and Red Hat's Linux OS, Sun's Solaris OS, Be's BeOS, Santa Cruz Operation's UnixWare, Novell's NetWare OS, and others, *see Findings of Fact* ¶ 153; Direct Testimony of Richard Schmalensee ¶ ¶ 215–23, 230, esp. table 5, *reprinted in* 7 J.A. at 4302–05, 4310; Direct Testimony of James Allchin ¶ ¶ 261–77, *reprinted in* 5 J.A. at 3384–92.

Of course price bundling by competitive OS makers would tend to exonerate Microsoft only if the sellers in question sold their browser/OS combinations *exclusively* at a bundled price. If a competitive seller offers a discount for a browserless version, then—at least as to *its* OS and browser—the gains from bundling are outweighed by those from separate choice. The evidence on discounts appears to be in conflict. *Compare* Direct Testimony of Richard Schmalensee ¶ 241, *reprinted in* 7 J.A. at 4315, *with* 1/6/99 pm Tr. at 42 (trial testimony of Franklin Fisher). If Schmalensee is correct that nearly all OS makers do not offer a discount, then the harm from tying—obstruction of direct consumer choice—would be theoretically created by virtually all sellers: a customer who would prefer an alternate browser is forced to pay the full price of that browser even though its value to him is only the increment in value over the bundled browser. (The result is similar to that from non-removal, which forces consumers who want the alternate browser to surrender disk space taken up by the unused, bundled browser.) If the failure to offer a price discount were universal, any impediment to direct consumer choice created by Microsoft's price-bundled sale of IE with Windows would be matched throughout the market; yet these OS suppliers on the competitive fringe would have evidently found this price bundling on balance efficient. If Schmalensee's assertions are ill-founded, of course, no such inference could be drawn.

V. Trial Proceedings and Remedy

Microsoft additionally challenges the District Court's procedural rulings on two fronts. First, with respect to the trial phase, Microsoft proposes that the court mismanaged its docket by adopting an expedited trial schedule and receiving evidence through summary witnesses. Second, with respect to the remedies decree, Microsoft argues that the court improperly ordered that it be divided into two separate companies. Only the latter claim will long detain us. The District Court's trial-phase procedures were comfortably within the bounds of its broad discretion to conduct trials as it sees fit. We conclude, however, that the District Court's remedies decree must be vacated for three independent reasons: (1) the court failed to hold a remedies-specific evidentiary hearing when there were disputed facts; (2) the court failed to provide adequate reasons for its decreed remedies; and (3) this Court has revised the scope of Microsoft's liability and it is impossible to determine to what extent that should affect the remedies provisions.

A. Factual Background

On April 3, 2000, the District Court concluded the liability phase of the proceedings by the filing of its Conclusions of Law holding that Microsoft had violated §§ 1 and 2 of the Sherman Act. The court and the parties then began discussions of the procedures to be followed in the imposition of remedies. Initially, the District Court signaled that it would enter relief only after conducting a new round of proceedings. In its Conclusions of Law, the court stated that it would issue a remedies order "following proceedings to be established by further Order of the Court." *Conclusions of Law*, at 57. And, when during a post-trial conference, Microsoft's counsel asked whether the court "contemplate[d] further proceedings," the judge replied, "Yes. Yes. I assume that there would be further proceedings." 4/4/00 Tr. at 8–9, 11, *reprinted in* 4 J.A. at 2445–46, 2448. The District Court further speculated that those proceedings might "replicate the procedure at trial with testimony in written form subject to cross-examination." *Id.* at 11, *reprinted in* 4 J.A. at 2448.

On April 28, 2000, plaintiffs submitted their proposed final judgment, accompanied by six new supporting affidavits and several exhibits. In addition to a series of temporary conduct restrictions, plaintiffs proposed that Microsoft be split into two independent corporations, with one continuing Microsoft's operating systems business and the other undertaking the balance of Microsoft's operations. Plaintiffs' Proposed Final Judgment at 2–3, *reprinted in* 4 J.A. at 2473–74. Microsoft filed a "summary response" on May 10, contending both that the proposed decree was too severe and that it would be impossible to resolve certain remedies-specific factual disputes "on a highly expedited basis." Defendant's Summary

Response at 6–7, *reprinted in* 4 J.A. at 2587–88. Another May 10 submission argued that if the District Court considered imposing plaintiffs' proposed remedy, "then substantial discovery, adequate time for preparation and a full trial on relief will be required." Defendant's Position as to Future Proceedings at 2, *reprinted in* 4 J.A. at 2646.

After the District Court revealed during a May 24 hearing that it was prepared to enter a decree without conducting "any further process," 5/24/00 pm Tr. at 33, *reprinted in* 14 J.A. at 9866, Microsoft renewed its argument that the underlying factual disputes between the parties necessitated a remedies-specific evidentiary hearing. In two separate offers of proof, Microsoft offered to produce a number of pieces of evidence, including the following:

- Testimony from Dr. Robert Crandall, a Senior Fellow at the Brookings Institution, that divestiture and dissolution orders historically have "failed to improve economic welfare by reducing prices or increasing output." Defendant's Offer of Proof at 2, *reprinted in* 4 J.A. at 2743.
- Testimony from Professor Kenneth Elzinga, Professor of Economics at the University of Virginia, that plaintiffs' proposed remedies would not induce entry into the operating systems market. *Id.* at 4, *reprinted in* 4 J.A. at 2745.
- Testimony from Dean Richard Schmalensee, Dean of MIT's Sloan School of Management, that dividing Microsoft likely would "harm consumers through higher prices, lower output, reduced efficiency, and less innovation" and would "produce immediate, substantial increases in the prices of both Windows and Office." *Id.* at 8, *reprinted in* 4 J.A. at 2749. Indeed, it would cause the price of Windows to triple. *Id.*
- Testimony from Goldman, Sachs & Co. and from Morgan Stanley Dean Witter that dissolution would adversely affect shareholder value. *Id.* at 17, 19, *reprinted in* 4 J.A. at 2758, 2760.

- Testimony from Microsoft Chairman Bill Gates that dividing Microsoft "along the arbitrary lines proposed by the Government" would devastate the company's proposed Next Generation Windows Services platform, which would allow software developers to write web-based applications that users could access from a wide range of devices. *Id.* at 21–22, *reprinted in* 4 J.A. at 2762–63.
- Testimony from Steve Ballmer, Microsoft's President and CEO, that Microsoft is organized as a unified company and that "there are no natural lines along which Microsoft could be broken up without causing serious problems." *Id.* at 23, *reprinted in* 4 J.A. at 2764.
- Testimony from Michael Capellas, CEO of Compaq, that splitting Microsoft in two "will make it more difficult for OEMs to provide customers with the tightly integrated product offerings they demand" in part because "complementary products created by unrelated companies do not work as well together as products created by a single company." Defendant's Supplemental Offer of Proof at 2, *reprinted in* 4 J.A. at 2823.

Over Microsoft's objections, the District Court proceeded to consider the merits of the remedy and on June 7, 2000 entered its final judgment. The court explained that it would not conduct "extended proceedings on the form a remedy should take," because it doubted that an evidentiary hearing would "give any significantly greater assurance that it will be able to identify what might be generally regarded as an optimum remedy." *Final Judgment*, at 62. The bulk of Microsoft's proffered facts were simply conjectures about future events, and "[i]n its experience the Court has found testimonial predictions of future events generally less reliable even than testimony as to historical fact, and cross-examination to be of little use in enhancing or detracting from their accuracy." *Id.* Nor was the court swayed by Microsoft's "profession of surprise" at the possibility of structural relief. *Id.* at 61. "From the inception of this case Microsoft knew, from well-established Supreme Court precedents dating from the beginning of the last century, that a mandated divestiture was a possibility, if not a probability, in the event of an adverse result at trial." *Id.*

The substance of the District Court's remedies order is nearly identical to plaintiffs' proposal. The decree's centerpiece is the requirement that Microsoft submit a proposed plan of divestiture, with the company to be split into an "Operating Systems Business," or "OpsCo," and an "Applications Business," or "AppsCo." *Final Judgment*, Decree §§ 1.a, l.c.i, at 64. OpsCo would receive all of Microsoft's operating systems, such as Windows 98 and Windows 2000, while AppsCo would receive the remainder of Microsoft's businesses, including IE and Office. The District Court identified four reasons for its "reluctant[ ]" conclusion that "a structural remedy has become imperative." *Id.* at 62. First, Microsoft "does not yet concede that any of its business practices violated the Sherman Act." *Id.* Second, the company consequently "continues to do business as it has in the past." *Id.* Third, Microsoft "has proved untrustworthy in the past." *Id.* And fourth, the Government, whose officials "are by reason of office obliged and expected to consider—and to act in—the public interest," won the case, "and for that reason alone have some entitlement to a remedy of their choice." *Id.* at 62–63.

The decree also contains a number of interim restrictions on Microsoft's conduct. For instance, Decree § 3.b requires Microsoft to disclose to third-party developers the APIs and other technical information necessary to ensure that software effectively interoperates with Windows. *Id.* at 67. "To facilitate compliance," § 3.b further requires that Microsoft establish "a secure facility" at which third-party representatives may "study, interrogate and interact with relevant and necessary portions of [Microsoft platform software] source code." *Id.* Section 3.e, entitled "Ban on Exclusive Dealing," forbids Microsoft from entering contracts which oblige third parties to restrict their "development, production, distribution, promotion or use of, or payment for" non-Microsoft platform-level software. *Id.* at 68. Under Decree § 3.f—"Ban on

Contractual Tying"—the company may not condition its grant of a Windows license on a party's agreement "to license, promote, or distribute any other Microsoft software product." *Id.* And § 3.g imposes a "Restriction on Binding Middleware Products to Operating System Products" unless Microsoft also offers consumers "an otherwise identical version" of the operating system without the middleware. *Id.*

B. Trial Proceedings

Microsoft's first contention—that the District Court erred by adopting an expedited trial schedule and receiving evidence through summary witnesses—is easily disposed of. Trial courts have extraordinarily broad discretion to determine the manner in which they will conduct trials. "This is particularly true in a case such as the one at bar where the proceedings are being tried to the court without a jury." *Eli Lilly & Co., Inc. v. Generix Drug Sales, Inc.*, 460 F.2d 1096, 1105 (5th Cir. 1972). In such cases, "[a]n appellate court will not interfere with the trial court's exercise of its discretion to control its docket and dispatch its business . . . except upon the clearest showing that the procedures have resulted in actual and substantial prejudice to the complaining litigant." *Id.* Microsoft fails to clear this high hurdle. Although the company claims that setting an early trial date inhibited its ability to conduct discovery, it never identified a specific deposition or document it was unable to obtain. And while Microsoft now argues that the use of summary witnesses made inevitable the improper introduction of hearsay evidence, the company actually agreed to the District Court's proposal to limit each side to 12 summary witnesses. 12/2/98 am Tr. at 11, *reprinted in* 21 J.A. at 14083 (court admonishing Microsoft's counsel to "[k]eep in mind that both sides agreed to the number of witnesses"). Even absent Microsoft's agreement, the company's challenge fails to show that this use of summary witnesses falls outside the trial court's wide latitude to receive evidence as it sees fit. *General Elec. Co. v. Joiner*, 522 U.S. 136, 141–42 (1997). This is particularly true given the presumption that a judge who conducts a bench trial has ignored any inadmissible evidence, *Harris v. Rivera*, 454 U.S. 339, 346 (1981)—a presumption that Microsoft makes no serious attempt to overcome. Indeed, under appropriate circumstances with appropriate instructions, we have in the past approved the use of summary witnesses even in jury trials. *See, e.g.*, *United States v. Lemire*, 720 F.2d 1327 (D.C. Cir. 1983). Therefore, neither the use of the summary witnesses nor any other aspect of the District Court's conduct of the trial phase amounted to an abuse of discretion.

C. Failure to Hold an Evidentiary Hearing

The District Court's remedies-phase proceedings are a different matter. It is a cardinal principle of our system of justice that factual disputes must be heard in open court and resolved through trial-like evidentiary proceedings. Any other course would be contrary "to the spirit which imbues our judicial tribunals prohibiting decision without hearing." *Sims v. Greene,* 161 F.2d 87, 88 (3d Cir. 1947).

A party has the right to judicial resolution of disputed facts not just as to the liability phase, but also as to appropriate relief. "Normally, an evidentiary hearing is required before an injunction may be granted." *United States v. McGee*, 714 F.2d 607, 613 (6th Cir. 1983); *see also Charlton v. Estate of Charlton*, 841 F.2d 988, 989 (9th Cir. 1988) ("Generally the entry or continuation of an injunction requires a hearing. Only when the facts are not in dispute, or when the adverse party has waived its right to a hearing, can that significant procedural step be eliminated." (citation and internal quotation marks omitted)). Other than a temporary restraining order, no injunctive relief may be entered without a hearing. *See generally* FED. R. CIV. P. 65. A hearing on the merits—*i.e.*, a trial on liability—does not substitute for a relief-specific evidentiary hearing unless the matter of relief was part of the trial on liability, or unless there are no disputed factual issues regarding the matter of relief.

This rule is no less applicable in antitrust cases. The Supreme Court "has recognized that a 'full exploration of facts is usually necessary in order (for the District Court) properly to draw (an antitrust) decree' so as 'to prevent future violations and eradicate existing evils.' " *United States* *v. Ward Baking Co.*, 376 U.S. 327, 330–31 (1964) (quoting *Associated Press v. United States*, 326 U.S. 1, 22 (1945)). Hence a remedies decree must be vacated whenever there is "a bona fide disagreement concerning substantive items of relief which could be resolved only by trial." *Id.* at 334; *cf. Sims*, 161 F.2d at 89 ("It has never been supposed that a temporary injunction could issue under the Clayton Act without giving the party against whom the injunction was sought an opportunity to present evidence on his behalf.").

Despite plaintiffs' protestations, there can be no serious doubt that the parties disputed a number of facts during the remedies phase. In two separate offers of proof, Microsoft identified 23 witnesses who, had they been permitted to testify, would have challenged a wide range of plaintiffs' factual representations, including the feasibility of dividing Microsoft, the likely impact on consumers, and the effect of divestiture on shareholders. To take but two examples, where plaintiffs' economists testified that splitting Microsoft in two would be socially beneficial, the company offered to prove that the proposed remedy would "cause substantial social harm by raising software prices, lowering rates of innovation and disrupting the evolution of Windows as a software development platform." Defendant's Offer of Proof at 6, *reprinted in* 4 J.A. at 2747. And where plaintiffs' investment banking experts proposed that divestiture might actually increase shareholder value, Microsoft proffered evidence that structural relief "would inevitably result in a significant loss of shareholder value," a loss that could reach "tens—possibly hundreds—of billions of dollars." *Id.* at 19, *reprinted in* 4 J.A. at 2760.

Indeed, the District Court itself appears to have conceded the existence of acute factual disagreements between Microsoft and plaintiffs. The court acknowledged that the parties were "sharply divided" and held "divergent opinions" on the likely results of its remedies decree. *Final Judgment*, at 62. The reason the court declined to conduct an evidentiary hearing was not because of the absence of disputed facts, but because it believed that those disputes could be resolved only through "actual experience," not further proceedings. *Id.*

But a prediction about future events is not, as a prediction, any less a factual issue. Indeed, the Supreme Court has acknowledged that drafting an antitrust decree by necessity "involves predictions and assumptions concerning future economic and business events." *Ford Motor Co. v. United States*, 405 U.S. 562, 578 (1972). Trial courts are not excused from their obligation to resolve such matters through evidentiary hearings simply because they consider the bedrock procedures of our justice system to be "of little use." *Final Judgment*, at 62.

The presence of factual disputes thus distinguishes this case from the decisions plaintiffs cite for the proposition that Microsoft was not entitled to an evidentiary hearing. Indeed, far from assisting plaintiffs, these cases actually confirm the proposition that courts must hold evidentiary hearings when they are confronted with disputed facts. In *Ford Motor Co.*, the Supreme Court affirmed a divestiture order after emphasizing that the District Court had "held nine days of hearings on the remedy." 405 U.S. at 571. In *Davoll v. Webb*, 194 F.3d 1116 (10th Cir. 1999), the defendant both failed to submit any offers of proof, and waived its right to an evidentiary hearing by expressly agreeing that relief should be determined based solely on written submissions. *Id.* at 1142–43. The defendants in *American Can Co. v. Mansukhani*, 814 F.2d 421 (7th Cir. 1987), were not entitled to a hearing on remedies because they failed "to explain to the district court what new proof they would present to show" that the proposed remedy was unwarranted. *Id.* at 425. And in *Socialist Workers Party v. Illinois State Board of Elections*, 566 F.2d 586 (7th Cir. 1977), *aff'd*, 440 U.S. 173 (1979), the Seventh Circuit held that a remedies-specific hearing was unnecessary because that case involved a pure question of legal interpretation and hence "[t]here was no factual dispute as to the ground on which the injunction was ordered." *Id.* at 587.

Unlike the parties in *Davoll*, *American Can*, and *Socialist Workers Party*, Microsoft both repeatedly asserted its right to an evidentiary hearing and submitted two offers of proof. The company's "summary response" to the proposed remedy argued that it would be "impossible" to address underlying factual issues "on a highly expedited basis," Defendant's Summary Response at 6–7, *reprinted in* 4 J.A. at 2587–88, and Microsoft further maintained that the court could not issue a decree unless it first permitted "substantial discovery, adequate time for preparation and a full trial on relief." Defendant's Position as to Future Proceedings at 2, *reprinted in* 4 J.A. at 2646. And in 53 pages of submissions, Microsoft identified the specific evidence it would introduce to challenge plaintiffs' representations.

Plaintiffs further argue—and the District Court held—that no evidentiary hearing was necessary given that Microsoft long had been on notice that structural relief was a distinct possibility. It is difficult to see why this matters. Whether Microsoft had advance notice that dissolution was in the works is immaterial to whether the District Court violated the company's procedural rights by ordering it without an evidentiary hearing. To be sure, "claimed surprise at the district court's decision to consider permanent injunctive relief does not, alone, merit reversal." *Socialist Workers*, 566 F.2d at 587. But in this case, Microsoft's professed surprise does not stand "alone." There is something more: the company's basic procedural right to have disputed facts resolved through an evidentiary hearing.

In sum, the District Court erred when it resolved the parties' remedies-phase factual disputes by consulting only the evidence introduced during trial and plaintiffs' remedies-phase submissions, without considering the evidence Microsoft sought to introduce. We therefore vacate the District Court's final judgment, and remand with instructions to conduct a remedies-specific evidentiary hearing.

D. Failure to Provide an Adequate Explanation

We vacate the District Court's remedies decree for the additional reason that the court has failed to provide an adequate explanation for the relief it ordered. The Supreme Court has explained that a remedies decree in an antitrust case must seek to "unfetter a market from anticompetitive conduct," *Ford Motor Co.*, 405 U.S. at 577, to "terminate the illegal monopoly, deny to the defendant the fruits of its statutory violation, and ensure that there remain no practices likely to result in monopolization in the future," *United States v. United Shoe Mach. Corp.*, 391 U.S. 244, 250 (1968); *see also United States v. Grinnell Corp.*, 384 U.S. 563, 577 (1966).

The District Court has not explained how its remedies decree would accomplish those objectives. Indeed, the court devoted a mere four paragraphs of its order to explaining its reasons for the remedy. They are: (1) Microsoft "does not yet concede that any of its business practices violated the Sherman Act"; (2) Microsoft "continues to do business as it has in the past"; (3) Microsoft "has proved untrustworthy in the past"; and (4) the Government, whose officials "are by reason of office obliged and expected to consider—and to act in—the public interest," won the case, "and for that reason alone have some entitlement to a remedy of their choice." *Final Judgment*, at 62–63. Nowhere did the District Court discuss the objectives the Supreme Court deems relevant.

E. Modification of Liability

Quite apart from its procedural difficulties, we vacate the District Court's final judgment in its entirety for the additional, independent reason that we have modified the underlying bases of liability. Of the three antitrust violations originally identified by the District Court, one is no longer viable: attempted monopolization of the browser market in violation of Sherman Act § 2. One will be remanded for liability proceedings under a different legal standard: unlawful tying in violation of § 1. Only liability for the § 2 monopoly-maintenance violation has been affirmed—and even that we have revised. Ordinarily, of course, we review the grant or denial of equitable relief under the abuse of discretion standard. *See, e.g.*, *Doran v. Salem Inn, Inc.*, 422 U.S. 922, 931–32 (1975) ("[T]he standard of appellate review is simply whether the issuance of the injunction, in the light of the applicable standard, constituted an abuse of discretion."). For obvious reasons, the application of that standard is not sufficient to sustain the remedy in the case before us. We cannot determine whether the District Court has abused its discretion in remedying a wrong where the court did not exercise that discretion in order to remedy the properly determined wrong. That is, the District Court determined that the conduct restrictions and the pervasive structural remedy were together appropriate to remedy the three antitrust violations set forth above. The court did not exercise its discretion to determine whether all, or for that matter, any, of those equitable remedies were required to rectify a § 2 monopoly maintenance violation taken alone. We therefore cannot sustain an exercise of discretion not yet made.

By way of comparison, in *Spectrum Sports, Inc. v. McQuillan*, 506 U.S. 447 (1993), the Supreme Court reviewed a damages award in a Sherman Act case. In that case, the trial court entered judgment upon a jury verdict which did not differentiate among multiple possible theories of liability under § 2. The Supreme Court ultimately determined that the trial record could not legally support a finding that the defendant had committed an illegal attempt to monopolize, and that "the trial instructions allowed the jury to infer specific intent and dangerous probability of success from the defendants' predatory conduct, without any proof of the relevant market or of a realistic probability that the defendants could achieve monopoly power in that market." *Id.* at 459. Therefore, the High Court reversed the Ninth Circuit's judgment affirming the District Court and remanded for further proceedings, expressly because "the jury's verdict did not negate the possibility that the § 2 verdict rested on the attempt to monopolize grounds alone. . . ." *Id.* Similarly, here, we cannot presume that a District Court would exercise its discretion to fashion the same remedy where the erroneous grounds of liability were stripped from its consideration.

The Eighth Circuit confronted a similar problem in *Concord Boat Corp. v. Brunswick Corp.*, 207 F.3d 1039 (8th Cir.), *cert. denied*, 121 S. Ct. 428 (2000). In that case, a group of boat builders brought an action against an engine manufacturer alleging violations of Sherman Act §§ 1 and 2, and Clayton Act § 7. After a 10–week trial, the jury found Brunswick liable on all three counts and returned a verdict for over $44 million. On appeal, the Eighth Circuit reversed the Clayton Act claim. *Id.* at 1053. That court held that, as a consequence, it was required to vacate the jury's remedy in its entirety. Because the "verdict form did not require the jury to consider what damages resulted from each type of violation," the court could not "know what damages it found to have been caused by the acquisitions upon which the Section 7 claims were based." *Id.* at 1054. The court rejected the proposition that "the entire damage award may be upheld based on Brunswick's Sherman Act liability alone," *id.* at 1053, holding that, because "there is no way to know what damages the jury assigned to the Section 7 claims," the defendant "would be entitled at the very least to a new damages trial on the boat builders' Sherman Act claims," *id.* at 1054.

Spectrum Sports and *Concord Boat* are distinguishable from the case before us in that both involved the award of money damages rather than equitable relief. Nonetheless, their reasoning is instructive. A court in both contexts must base its relief on some clear "indication of a significant causal connection between the conduct enjoined or mandated and the violation found directed toward the remedial goal intended." 3 PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW ¶ 653(b), at 91–92 (1996). In a case such as the one before us where sweeping equitable relief is employed to remedy multiple violations, and some—indeed most—of the findings of remediable violations do not withstand appellate scrutiny, it is necessary to vacate the remedy decree since the implicit findings of causal connection no longer exist to warrant our deferential affirmance.

In short, we must vacate the remedies decree in its entirety and remand the case for a new determination. This court has drastically altered the District Court's conclusions on liability. On remand, the District Court, after affording the parties a proper opportunity to be heard, can fashion an appropriate remedy for Microsoft's antitrust violations. In particular, the court should consider which of the decree's conduct restrictions remain viable in light of our modification of the original liability decision. While the task of drafting the remedies decree is for the District Court in the first instance, because of the unusually convoluted nature of the proceedings thus far, and a desire to advance the ultimate resolution of this important controversy, we offer some further guidance for the exercise of that discretion.

F. On Remand

As a general matter, a district court is afforded broad discretion to enter that relief it calculates will best remedy the conduct it has found to be unlawful. *See, e.g.*, *Woerner v. United States Small Bus. Admin.*, 934 F.2d 1277, 1279 (D.C. Cir. 1991) (recognizing that an appellate court reviews a trial court's decision whether or not to grant equitable relief only for an abuse of discretion). This is no less true in antitrust cases. *See, e.g.*, *Ford Motor Co.*, 405 U.S. at 573 ("The District Court is clothed with 'large discretion' to fit the decree to the special needs of the individual case."); *Md. & Va. Milk Producers Ass'n, Inc. v. United States*, 362 U.S. 458, 473 (1960) ("The formulation of decrees is largely left to the discretion of the trial court . . . ."). And divestiture is a common form of relief in successful antitrust prosecutions: it is indeed "the most important of antitrust remedies." *See, e.g.*, *United States v. E.I. du Pont de Nemours & Co.*, 366 U.S. 316, 331 (1961).

On remand, the District Court must reconsider whether the use of the structural remedy of divestiture is appropriate with respect to Microsoft, which argues that it is a unitary company. By and large, cases upon which plaintiffs rely in arguing for the split of Microsoft have involved the dissolution of entities formed by mergers and acquisitions. On the contrary, the Supreme Court has clarified that divestiture "has traditionally been the remedy for Sherman Act violations whose heart is intercorporate *combination and control*," *du Pont*, 366 U.S. at 329 (emphasis added), and that "[c]omplete divestiture is particularly appropriate where asset or stock *acquisitions* violate the antitrust laws," *Ford Motor Co.*, 405 U.S. at 573 (emphasis added).

One apparent reason why courts have not ordered the dissolution of unitary companies is logistical difficulty. As the court explained in *United States v. ALCOA*, 91 F. Supp.

333, 416 (S.D.N.Y. 1950), a "corporation, designed to operate effectively as a single entity, cannot readily be dismembered of parts of its various operations without a marked loss of efficiency." A corporation that has expanded by acquiring its competitors often has preexisting internal lines of division along which it may more easily be split than a corporation that has expanded from natural growth. Although time and corporate modifications and developments may eventually fade those lines, at least the identifiable entities preexisted to create a template for such division as the court might later decree. With reference to those corporations that are not acquired by merger and acquisition, Judge Wyzanski accurately opined in *United Shoe*:

> United conducts all machine manufacture at one plant in Beverly, with one set of jigs and tools, one foundry, one laboratory for machinery problems, one managerial staff, and one labor force. It takes no Solomon to see that this organism cannot be cut into three equal and viable parts.

United States v. United Shoe Machine Co., 110 F. Supp. 295, 348 (D. Mass. 1953).

Depending upon the evidence, the District Court may find in a remedies proceeding that it would be no easier to split Microsoft in two than United Shoe in three. Microsoft's Offer of Proof in response to the court's denial of an evidentiary hearing included proffered testimony from its President and CEO Steve Ballmer that the company "is, and always has been, a unified company without free-standing business units. Microsoft is not the result of mergers or acquisitions." Microsoft further offered evidence that it is "not organized along product lines," but rather is housed in a single corporate headquarters and that it has

> only one sales and marketing organization which is responsible for selling all of the company's products, one basic research organization, one product support organization, one operations department, one information technology department, one facilities department, one purchasing department, one human resources department,

> one finance department, one legal department and one public relations department.

Defendant's Offer of Proof at 23–26, *reprinted in* 4 J.A. at 2764–67. If indeed Microsoft is a unitary company, division might very well require Microsoft to reproduce each of these departments in each new entity rather than simply allocate the differing departments among them.

In devising an appropriate remedy, the District Court also should consider whether plaintiffs have established a sufficient causal connection between Microsoft's anticompetitive conduct and its dominant position in the OS market. "Mere existence of an exclusionary act does not itself justify full feasible relief against the monopolist to create maximum competition." 3 AREEDA & HOVENKAMP, ANTITRUST LAW ¶ 650a, at 67. Rather, structural relief, which is "designed to eliminate the monopoly altogether . . . require[s] a clearer indication of a *significant causal connection* between the conduct and creation or maintenance of the market power." *Id.* ¶ 653b, at 91–92 (emphasis added). Absent such causation, the antitrust defendant's unlawful behavior should be remedied by "an injunction against continuation of that conduct." *Id.* ¶ 650a, at 67.

As noted above, *see supra* Section II.C, we have found a causal connection between Microsoft's exclusionary conduct and its continuing position in the operating systems market only through inference. *See* 3 AREEDA & HOVENKAMP, ANTITRUST LAW ¶ 653(b), at 91–92 (suggesting that "more extensive equitable relief, particularly remedies such as divestiture designed to eliminate the monopoly altogether, . . . require a clearer indication of significant causal connection between the conduct and creation or maintenance of the market power"). Indeed, the District Court expressly did not adopt the position that Microsoft would have lost its position in the OS market but for its anticompetitive behavior. *Findings of Fact* ¶ 411 ("There is insufficient evidence to find that, absent Microsoft's actions, Navigator and Java already would have ignited genuine competition in the market for Intel-compatible PC operating systems."). If the court on remand is unconvinced of the causal connection between Microsoft's exclusionary conduct and the company's position in the OS market, it may well conclude that divestiture is not an appropriate remedy.

While we do not undertake to dictate to the District Court the precise form that relief should take on remand, we note again that it should be tailored to fit the wrong creating the occasion for the remedy.

G. Conclusion

In sum, we vacate the District Court's remedies decree for three reasons. First, the District Court failed to hold an evidentiary hearing despite the presence of remedies-specific factual disputes. Second, the court did not provide adequate reasons for its decreed remedies. Finally, we have drastically altered the scope of Microsoft's liability, and it is for the District Court in the first instance to determine the propriety of a specific remedy for the limited ground of liability which we have upheld.

VI. Judicial Misconduct

Canon 3A(6) of the Code of Conduct for United States Judges requires federal judges to "avoid public comment on the merits of [ ] pending or impending" cases. Canon 2 tells judges to "avoid impropriety and the appearance of impropriety in all activities," on the bench and off. Canon 3A(4) forbids judges to initiate or consider *ex parte* communications on the merits of pending or impending proceedings. Section 455(a) of the Judicial Code requires judges to recuse themselves when their "impartiality might reasonably be questioned." 28 U.S.C. § 455(a).

All indications are that the District Judge violated each of these ethical precepts by talking about the case with reporters. The violations were deliberate, repeated, egregious, and flagrant. The only serious question is what consequences should follow. Microsoft urges us to disqualify the District Judge, vacate the judgment in its entirety and toss out the findings of fact, and remand for a new trial before a different District Judge. At the other extreme, plaintiffs ask us to do nothing. We agree with neither position.

A. The District Judge's Communications with the Press

Immediately after the District Judge entered final judgment on June 7, 2000, accounts of interviews with him began appearing in the press. Some of the interviews were held after he entered final judgment. *See* Peter Spiegel, *Microsoft Judge Defends Post-trial Comments*, FIN. TIMES (London), Oct. 7, 2000, at 4; John R. Wilke, *For Antitrust Judge, Trust, or Lack of It, Really Was the Issue—In an Interview, Jackson Says Microsoft Did the Damage to Its Credibility in Court*, WALL ST. J., June 8, 2000, at A1. The District Judge also aired his views about the case to larger audiences, giving speeches at a college and at an antitrust seminar. *See* James V. Grimaldi, *Microsoft Judge Says Ruling at Risk; Every Trial Decision Called 'Vulnerable'*, WASH. POST, Sept. 29, 2000, at E1; Alison Schmauch, *Microsoft Judge Shares Experiences*, THE DARTMOUTH ONLINE, Oct. 3, 2000.

From the published accounts, it is apparent that the Judge also had been giving secret interviews to select reporters before entering final judgment—in some instances long before. The earliest interviews we know of began in September 1999, shortly after the parties finished presenting evidence but two months before the court issued its Findings of Fact. *See* Joel Brinkley & Steve Lohr, *U.S. vs. Microsoft: Pursuing a Giant; Retracing the Missteps in the Microsoft Defense*, N.Y. TIMES, June 9, 2000, at A1. Interviews with reporters from the *New York Times* and Ken Auletta, another reporter who later wrote a book on the Microsoft case, continued throughout late 1999 and the first half of 2000, during which time the Judge issued his Findings of Fact, Conclusions of Law, and Final Judgment. *See id.*; Ken Auletta, *Final Offer*, THE NEW YORKER, Jan. 15, 2001, at 40. The Judge "embargoed" these interviews; that is, he insisted that the fact and content of the interviews remain secret until he issued the Final Judgment.

Before we recount the statements attributed to the District Judge, we need to say a few words about the state of the record. All we have are the published accounts and what the reporters say the Judge said. Those accounts were not admitted in evidence. They may be hearsay. *See* FED. R. EVID. 801(c); *Metro. Council of NAACP Branches v. FCC*, 46 F.3d 1154, 1165 (D.C. Cir. 1995) ("We seriously question whether a New York Times article is admissible evidence of the truthfulness of its contents.").

We are of course concerned about granting a request to disqualify a federal judge when the material supporting it has not been admitted in evidence. Disqualification is never taken lightly. In the wrong hands, a disqualification motion is a procedural weapon to harass opponents and delay proceedings. If supported only by rumor, speculation, or innuendo, it is also a means to tarnish the reputation of a federal judge.

But the circumstances of this case are most unusual. By placing an embargo on the interviews, the District Judge ensured that the full extent of his actions would not be revealed until this case was on appeal. Plaintiffs, in defending the judgment, do not dispute the statements attributed to him in the press; they do not request an evidentiary hearing; and they do not argue that Microsoft should have filed a motion in the District Court before raising the matter on appeal. At oral argument, plaintiffs all but conceded that the Judge violated ethical restrictions by discussing the case in public: "On behalf of the governments, I have no brief to defend the District Judge's decision to discuss this case publicly while it was pending on appeal, and I have no brief to defend the judge's decision to discuss the case with reporters while the trial was proceeding, even given the embargo on any reporting concerning those conversations until after the trial." 02/27/01 Ct. Appeals Tr. at 326.

We must consider too that the federal disqualification provisions reflect a strong federal policy to preserve the actual and apparent impartiality of the federal judiciary. Judicial misconduct may implicate that policy regardless of the means by which it is disclosed to the public. *Cf. The Washington Post v. Robinson*, 935 F.2d 282, 291 (D.C. Cir.

1991) (taking judicial notice of newspaper articles to ascertain whether a fact was within public knowledge). Also, in our analysis of the arguments presented by the parties, the specifics of particular conversations are less important than their cumulative effect.

For these reasons we have decided to adjudicate Microsoft's disqualification request notwithstanding the state of the record. The same reasons also warrant a departure from our usual practice of declining to address issues raised for the first time on appeal: the "matter of what questions may be taken up and resolved for the first time on appeal is one left primarily to the discretion of the courts of appeals, to be exercised on the facts of individual cases." *Singleton v. Wulff*, 428 U.S. 106, 121 (1976); *accord Hormel v. Helvering*, 312 U.S. 552, 556–57 (1941); *Nat'l Ass'n of Mfrs. v. Dep't of Labor*, 159 F.3d 597, 605–06 (D.C. Cir. 1998). We will assume the truth of the press accounts and not send the case back for an evidentiary hearing on this subject. We reach no judgment on whether the details of the interviews were accurately recounted.

The published accounts indicate that the District Judge discussed numerous topics relating to the case. Among them was his distaste for the defense of technological integration—one of the central issues in the lawsuit. In September 1999, two months before his Findings of Fact and six months before his Conclusions of Law, and in remarks that were kept secret until after the Final Judgment, the Judge told reporters from the *New York Times* that he questioned Microsoft's integration of a web browser into Windows. Stating that he was "not a fan of integration," he drew an analogy to a 35–millimeter camera with an integrated light meter that in his view should also be offered separately: "You like the convenience of having a light meter built in, integrated, so all you have to do is press a button to get a reading. But do you think camera makers should also serve photographers who want to use a separate light meter, so they can hold it up, move it around?" JOEL BRINKLEY & STEVE LOHR, U.S. v. MICROSOFT 263 (2001). In other remarks, the Judge commented on the integration at the heart of the case: "[I]t was quite clear to me that the motive of Microsoft in bundling the Internet browser was not one of consumer convenience. The evidence that this was done for the consumer was not credible. . . . The evidence was so compelling that there was an ulterior motive." Wilke, WALL ST. J. As for tying law in general, he criticized this court's ruling in the consent decree case, saying it "was wrongheaded on several counts" and would exempt the software industry from the antitrust laws. BRINKLEY & LOHR, U.S. v. MICROSOFT 78, 295; Brinkley & Lohr, N.Y. TIMES.

Reports of the interviews have the District Judge describing Microsoft's conduct, with particular emphasis on what he regarded as the company's prevarication, hubris, and impenitence. In some of his secret meetings with reporters, the Judge offered his contemporaneous impressions of testimony. He permitted at least one reporter to see an entry concerning Bill Gates in his "oversized green notebook." KEN AULETTA, WORLD WAR 3.0, at 112 (2001). He also provided numerous after-the-fact credibility assessments. He told reporters that Bill Gates' "testimony is inherently without credibility" and "[i]f you can't believe this guy, who else can you believe?" BRINKLEY & LOHR, U.S. v. MICROSOFT 278; Brinkley & Lohr, N.Y. TIMES; *see also* Auletta, THE NEW YORKER, at 40. As for the company's other witnesses, the Judge is reported as saying that there "were times when I became impatient with Microsoft witnesses who were giving speeches." "[T]hey were telling me things I just flatly could not credit." Brinkley & Lohr, N.Y. TIMES. In an interview given the day he entered the break-up order, he summed things up: "Falsus in uno, falsus in omnibus": "Untrue in one thing, untrue in everything." "I don't subscribe to that as absolutely true. But it does lead one to suspicion. It's a universal human experience. If someone lies to you once, how much else can you credit as the truth?" Wilke, WALL ST. J.

According to reporter Auletta, the District Judge told him in private that, "I thought they [Microsoft and its executives] didn't think they were regarded as adult members of the community. I thought they would learn." AULETTA, WORLD WAR 3.0, at 14. The Judge told a college audience that "Bill

Gates is an ingenious engineer, but I don't think he is that adept at business ethics. He has not yet come to realise things he did (when Microsoft was smaller) he should not have done when he became a monopoly." Spiegel, FIN. TIMES. Characterizing Gates' and his company's "crime" as hubris, the Judge stated that "[i]f I were able to propose a remedy of my devising, I'd require Mr. Gates to write a book report" on Napoleon Bonaparte, "[b]ecause I think [Gates] has a Napoleonic concept of himself and his company, an arrogance that derives from power and unalloyed success, with no leavening hard experience, no reverses." Auletta, THE NEW YORKER, at 41; *see also* AULETTA, WORLD WAR 3.0, at 397. The Judge apparently became, in Auletta's words, "increasingly troubled by what he learned about Bill Gates and couldn't get out of his mind the group picture he had seen of Bill Gates and Paul Allen and their shaggy-haired first employees at Microsoft." The reporter wrote that the Judge said he saw in the picture "a smart-mouthed young kid who has extraordinary ability and needs a little discipline. I've often said to colleagues that Gates would be better off if he had finished Harvard." AULETTA, WORLD WAR 3.0, at 168–69; *see also* Auletta, THE NEW YORKER, at 46 (reporting the District Judge's statement that "they [Microsoft and its executives] don't act like grown-ups!" "[T]o this day they continue to deny they did anything wrong.").

The District Judge likened Microsoft's writing of incriminating documents to drug traffickers who "never figure out that they shouldn't be saying certain things on the phone." BRINKLEY & LOHR, U.S. V. MICROSOFT 6; Brinkley & Lohr, N.Y. TIMES. He invoked the drug trafficker analogy again to denounce Microsoft's protestations of innocence, this time with a reference to the notorious Newton Street Crew that terrorized parts of Washington, D.C. Reporter Auletta wrote in *The New Yorker* that the Judge

> went as far as to compare the company's declaration of innocence to the protestations of gangland killers. He was referring to five gang members in a racketeering, drug-dealing, and murder trial that he had presided over

> four years earlier. In that case, the three victims had had their heads bound with duct tape before they were riddled with bullets from semi-automatic weapons. "On the day of the sentencing, the gang members maintained that they had done nothing wrong, saying that the whole case was a conspiracy by the white power structure to destroy them," Jackson recalled. "I am now under no illusions that miscreants will realize that other parts of society will view them that way."

Auletta, THE NEW YORKER, at 40–41; AULETTA, WORLD WAR 3.0, at 369–70 (same); *see also* Auletta, THE NEW YORKER, at 46.

The District Judge also secretly divulged to reporters his views on the remedy for Microsoft's antitrust violations. On the question whether Microsoft was entitled to any process at the remedy stage, the Judge told reporters in May 2000 that he was "not aware of any case authority that says I have to give them any due process at all. The case is over. They lost." Brinkley & Lohr, N.Y. TIMES. Another reporter has the Judge asking "[w]ere the Japanese allowed to propose terms of their surrender?" Spiegel, FIN. TIMES. The District Judge also told reporters the month before he issued his break-up order that "[a]ssuming, as I think they are, [ ] the Justice Department and the states are genuinely concerned about the public interest," "I know they have carefully studied all the possible options. This isn't a bunch of amateurs. They have consulted with some of the best minds in America over a long period of time." "I am not in a position to duplicate that and re-engineer their work. There's no way I can equip myself to do a better job than they have done." Brinkley & Lohr, N.Y. TIMES; *cf. Final Judgment*, at 62–63.

In February 2000, four months before his final order splitting the company in two, the District Judge reportedly told *New York Times* reporters that he was "not at all comfortable with restructuring the company," because he was unsure whether he was "competent to do that." Brinkley & Lohr, N.Y. TIMES; *see also* BRINKLEY & LOHR, U.S. V. MICROSOFT 277–78 (same); *cf.* AULETTA, WORLD WAR 3.0, at 370 (comment by the Judge in April 2000 that he was inclining toward behavioral rather than structural remedies). A few months later, he had a change of heart. He told the same reporters that "with what looks like Microsoft intransigence, a breakup is inevitable." Brinkley & Lohr, N.Y. TIMES; *see also* BRINKLEY & LOHR, U.S. v. MICROSOFT 315. The Judge recited a "North Carolina mule trainer" story to explain his change in thinking from "[i]f it ain't broken, don't try to fix it" and "I just don't think that [restructuring the company] is something I want to try to do on my own" to ordering Microsoft broken in two:

> He had a trained mule who could do all kinds of wonderful tricks. One day somebody asked him: "How do you do it? How do you train the mule to do all these amazing things?" "Well," he answered, "I'll show you." He took a 2–by–4 and whopped him upside the head. The mule was reeling and fell to his knees, and the trainer said: "You just have to get his attention."

BRINKLEY & LOHR, U.S. v. MICROSOFT 278. The Judge added: "I hope I've got Microsoft's attention." *Id.*; *see also* Grimaldi, WASH. POST (comments by the Judge blaming the break-up on Microsoft's intransigence and on what he perceived to be Microsoft's responsibility for the failure of settlement talks); Spiegel, FIN. TIMES (the Judge blaming break-up on Microsoft's intransigence).

B. Violations of the Code of Conduct for United States Judges

The Code of Conduct for United States Judges was adopted by the Judicial Conference of the United States in 1973. It prescribes ethical norms for federal judges as a means to preserve the actual and apparent integrity of the federal judiciary. Every federal judge receives a copy of the Code, the Commentary to the Code, the Advisory Opinions of the Judicial Conference's Committee on Codes of Conduct, and digests of the Committee's informal, unpublished opinions. *See* II GUIDE TO JUDICIARY POLICIES AND PROCEDURES (1973). The material is periodically updated. Judges who have questions about whether their conduct would be consistent with the Code may write to the Codes of Conduct Committee for a written, confidential opinion. *See* Introduction, CODE OF CONDUCT. The Committee traditionally responds promptly. A judge may also seek informal advice from the Committee's circuit representative.

While some of the Code's Canons frequently generate questions about their application, others are straightforward and easily understood. Canon 3A(6) is an example of the latter. In forbidding federal judges to comment publicly "on the merits of a pending or impending action," Canon 3A(6) applies to cases pending before any court, state or federal, trial or appellate. *See* JEFFREY M. SHAMAN ET AL., JUDICIAL CONDUCT AND ETHICS § 10.34, at 353 (3d ed. 2000). As "impending" indicates, the prohibition begins even before a case enters the court system, when there is reason to believe a case may be filed. *Cf.* E. WAYNE THODE, REPORTER'S NOTES TO CODE OF JUDICIAL CONDUCT 54 (1973). An action remains "pending" until "completion of the appellate process." CODE OF CONDUCT Canon 3A(6) cmt.; Comm. on Codes of Conduct, Adv. Op. No. 55 (1998).

The Microsoft case was "pending" during every one of the District Judge's meetings with reporters; the case is "pending" now; and even after our decision issues, it will remain pending for some time. The District Judge breached his ethical duty under Canon 3A(6) each time he spoke to a reporter about the merits of the case. Although the reporters interviewed him in private, his comments were public. Court was not in session and his discussion of the case took place outside the presence of the parties. He provided his views not to court personnel assisting him in the case, but to members of the public. And these were not just any members of the public. Because he was talking to reporters, the Judge knew his comments would eventually receive widespread dissemination.

It is clear that the District Judge was not discussing purely procedural matters, which are a permissible subject of public comment under one of the Canon's three narrowly drawn exceptions. He disclosed his views on the factual and legal matters at the heart of the case. His opinions about the credibility of witnesses, the validity of legal theories, the culpability of the defendant, the choice of remedy, and so forth all dealt with the merits of the action. It is no excuse that the Judge may have intended to "educate" the public about the case or to rebut "public misperceptions" purportedly caused by the parties. *See* Grimaldi, WASH. POST; *Microsoft Judge Says He May Step down from Case on Appeal*, WALL ST. J., Oct. 30, 2000. If those were his intentions, he could have addressed the factual and legal issues as he saw them—and thought the public should see them—in his Findings of Fact, Conclusions of Law, Final Judgment, or in a written opinion. Or he could have held his tongue until all appeals were concluded.

Far from mitigating his conduct, the District Judge's insistence on secrecy—his embargo—made matters worse. Concealment of the interviews suggests knowledge of their impropriety. Concealment also prevented the parties from nipping his improprieties in the bud. Without any knowledge of the interviews, neither the plaintiffs nor the defendant had a chance to object or to seek the Judge's removal before he issued his Final Judgment.

Other federal judges have been disqualified for making limited public comments about cases pending before them. *See In re Boston's Children First*, 244 F.3d 164 (1st Cir. 2001); *In re IBM Corp.*, 45 F.3d 641 (2d Cir. 1995); *United States v. Cooley*, 1 F.3d 985 (10th Cir. 1993). Given the extent of the Judge's transgressions in this case, we have little doubt that if the parties had discovered his secret liaisons with the press, he would have been disqualified, voluntarily or by court order. *Cf. In re Barry*, 946 F.2d 913 (D.C. Cir. 1991) (per curiam); *id.* at 915 (Edwards, J., dissenting).

In addition to violating the rule prohibiting public comment, the District Judge's reported conduct raises serious questions under Canon 3A(4). That Canon states that a "judge should accord to every person who is legally interested in a proceeding, or the person's lawyer, full right to be heard according to law, and, except as authorized by law, neither initiate nor consider *ex parte* communications on the merits, or procedures affecting the merits, of a pending or impending proceeding." CODE OF CONDUCT Canon 3A(4).

What did the reporters convey to the District Judge during their secret sessions? By one account, the Judge spent a total of ten hours giving taped interviews to one reporter. AULETTA, WORLD WAR 3.0, at 14 n.*. We do not know whether he spent even more time in untaped conversations with the same reporter, nor do we know how much time he spent with others. But we think it safe to assume that these interviews were not monologues. Interviews often become conversations. When reporters pose questions or make assertions, they may be furnishing information, information that may reflect their personal views of the case. The published accounts indicate this happened on at least one occasion. Ken Auletta reported, for example, that he told the Judge "that Microsoft employees professed shock that he thought they had violated the law and behaved unethically," at which time the Judge became "agitated" by "Microsoft's 'obstinacy'." *Id.* at 369. It is clear that Auletta had views of the case. As he wrote in a *Washington Post* editorial, "[a]nyone who sat in [the District Judge's] courtroom during the trial had seen ample evidence of Microsoft's sometimes thuggish tactics." Ken Auletta, *Maligning the Microsoft Judge*, WASH. POST, Mar. 7, 2001, at A23.

The District Judge's repeated violations of Canons 3A(6) and 3A(4) also violated Canon 2, which provides that "a judge should avoid impropriety and the appearance of impropriety in all activities." CODE OF CONDUCT Canon 2; *see also In re Charge of Judicial Misconduct*, 47 F.3d 399, 400 (10th Cir. Jud. Council 1995) ("The allegations of extra-judicial comments cause the Council substantial concern under both Canon 3A(6) and Canon 2 of the Judicial Code of Conduct."). Canon 2A requires federal judges to "respect and comply with the law" and to "act at all times in a manner that promotes public confidence in the integrity and impartiality of the judiciary." CODE OF CONDUCT Canon 2A. The Code of Conduct is the law with respect to the ethical obligations of federal judges, and it is clear the District Judge violated it on multiple occasions in this case. The rampant disregard for the judiciary's ethical obligations that the public witnessed in this case undoubtedly jeopardizes "public confidence in the integrity" of the District Court proceedings.

Another point needs to be stressed. Rulings in this case have potentially huge financial consequences for one of the nation's largest publicly-traded companies and its investors. The District Judge's secret interviews during the trial provided a select few with inside information about the case, information that enabled them and anyone they shared it with to anticipate rulings before the Judge announced them to the world. Although he "embargoed" his comments, the Judge had no way of policing the reporters. For all he knew there may have been trading on the basis of the information he secretly conveyed. The public cannot be expected to maintain confidence in the integrity and impartiality of the federal judiciary in the face of such conduct.

C. Appearance of Partiality

The Code of Conduct contains no enforcement mechanism. *See* THODE, REPORTER'S NOTES TO CODE OF JUDICIAL CONDUCT 43. The Canons, including the one that requires a judge to disqualify himself in certain circumstances, *see* CODE OF CONDUCT Canon 3C, are self-enforcing. There are, however, remedies extrinsic to the Code. One is an internal disciplinary proceeding, begun with the filing of a complaint with the clerk of the court of appeals pursuant to 28 U.S.C. § 372(c). Another is disqualification of the offending judge under either 28 U.S.C. § 144, which requires the filing of an affidavit while the case is in the District Court, or 28 U.S.C. § 455, which does not. Microsoft urges the District Judge's disqualification under § 455(a): a judge "shall disqualify himself in any proceeding in which his impartiality might reasonably be questioned." 28 U.S.C. § 455(a). The standard for disqualification under § 455(a) is an objective one. The question is whether a reasonable and informed observer would question the judge's impartiality. *See In re Barry*, 946 F.2d at 914;

see also In re Aguinda, 241 F.3d 194, 201 (2d Cir. 2001); RICHARD E. FLAMM, JUDICIAL DISQUALIFICATION § 24.2.1 (1996).

"The very purpose of § 455(a) is to promote confidence in the judiciary by avoiding even the appearance of impropriety whenever possible." *Liljeberg v. Health Servs. Acquisition Corp.*, 486 U.S. 847, 865 (1988). As such, violations of the Code of Conduct may give rise to a violation of § 455(a) if doubt is cast on the integrity of the judicial process. It has been argued that any "public comment by a judge concerning the facts, applicable law, or merits of a case that is *sub judice* in his court or any comment concerning the parties or their attorneys would raise grave doubts about the judge's objectivity and his willingness to reserve judgment until the close of the proceeding." William G. Ross, *Extrajudicial Speech: Charting the Boundaries of Propriety*, 2 GEO. J. LEGAL ETHICS 589, 598 (1989). Some courts of appeals have taken a hard line on public comments, finding violations of § 455(a) for judicial commentary on pending cases that seems mild in comparison to what we are confronting in this case. *See Boston's Children First*, 244 F.3d 164 (granting writ of mandamus ordering district judge to recuse herself under § 455(a) because of public comments on class certification and standing in a pending case); *In re IBM Corp.*, 45 F.3d 641 (granting writ of mandamus ordering district judge to recuse himself based in part on the appearance of partiality caused by his giving newspaper interviews); *Cooley*, 1 F.3d 985 (vacating convictions and disqualifying district judge for appearance of partiality because he appeared on television program *Nightline* and stated that abortion protestors in a case before him were breaking the law and that his injunction would be obeyed).

While § 455(a) is concerned with actual and apparent impropriety, the statute requires disqualification only when a judge's "impartiality might reasonably be questioned." 28 U.S.C. § 455(a). Although this court has condemned public judicial comments on pending cases, we have not gone so far as to hold that every violation of Canon 3A(6) or every impropriety under the Code of Conduct inevitably destroys the appearance of impartiality and thus violates § 455(a).

See In re Barry, 946 F.2d at 914; *see also Boston's Children First*, 244 F.3d at 168; *United States v. Fortier*, 242 F.3d 1224, 1229 (10th Cir. 2001).

In this case, however, we believe the line has been crossed. The public comments were not only improper, but also would lead a reasonable, informed observer to question the District Judge's impartiality. Public confidence in the integrity and impartiality of the judiciary is seriously jeopardized when judges secretly share their thoughts about the merits of pending cases with the press. Judges who covet publicity, or convey the appearance that they do, lead any objective observer to wonder whether their judgments are being influenced by the prospect of favorable coverage in the media. Discreet and limited public comments may not compromise a judge's apparent impartiality, but we have little doubt that the District Judge's conduct had that effect. Appearance may be all there is, but that is enough to invoke the Canons and § 455(a).

Judge Learned Hand spoke of "this America of ours where the passion for publicity is a disease, and where swarms of foolish, tawdry moths dash with rapture into its consuming fire. . . ." LEARNED HAND, THE SPIRIT OF LIBERTY 132–33 (2d ed. 1953). Judges are obligated to resist this passion. Indulging it compromises what Edmund Burke justly regarded as the "cold neutrality of an impartial judge." Cold or not, federal judges must maintain the appearance of impartiality. What was true two centuries ago is true today: "Deference to the judgments and rulings of courts depends upon public confidence in the integrity and independence of judges." CODE OF CONDUCT Canon 1 cmt. Public confidence in judicial impartiality cannot survive if judges, in disregard of their ethical obligations, pander to the press.

We recognize that it would be extraordinary to disqualify a judge for bias or appearance of partiality when his remarks arguably reflected what he learned, or what he thought he learned, during the proceedings. *See Liteky v. United States*, 510 U.S. 540, 554–55 (1994); *United States v. Barry*, 961 F.2d 260, 263 (D.C. Cir. 1992). But this "extrajudicial source" rule has no bearing on the case before us. The problem here is not just what the District Judge said, but to whom he said it and when. His crude characterizations of Microsoft, his frequent denigrations of Bill Gates, his mule trainer analogy as a reason for his remedy—all of these remarks and others might not have given rise to a violation of the Canons or of § 455(a) had he uttered them from the bench. *See Liteky*, 510 U.S. at 555–56; CODE OF CONDUCT Canon 3A(6) (exception to prohibition on public comments for "statements made in the course of the judge's official duties"). But then Microsoft would have had an opportunity to object, perhaps even to persuade, and the Judge would have made a record for review on appeal. It is an altogether different matter when the statements are made outside the courtroom, in private meetings unknown to the parties, in anticipation that ultimately the Judge's remarks would be reported. Rather than manifesting neutrality and impartiality, the reports of the interviews with the District Judge convey the impression of a judge posturing for posterity, trying to please the reporters with colorful analogies and observations bound to wind up in the stories they write. Members of the public may reasonably question whether the District Judge's desire for press coverage influenced his judgments, indeed whether a publicity-seeking judge might consciously or subconsciously seek the publicity-maximizing outcome. We believe, therefore, that the District Judge's interviews with reporters created an appearance that he was not acting impartially, as the Code of Conduct and § 455(a) require.

D. *Remedies for Judicial Misconduct and Appearance of Partiality*

1. **Disqualification**

Disqualification is mandatory for conduct that calls a judge's impartiality into question. *See* 28 U.S.C. § 455(a); *In re School Asbestos Litig.*, 977 F.2d 764, 783 (3d Cir. 1992). Section 455 does not prescribe the scope of disqualification. Rather, Congress "delegated to the judiciary the task of fashioning the remedies that will best serve the purpose" of the disqualification statute. *Liljeberg*, 486 U.S. at 862.

At a minimum, § 455(a) requires prospective disqualification of the offending judge, that is, disqualification from the judge's hearing any further proceedings in the case. *See United States v. Microsoft Corp.*, 56 F.3d 1448, 1463–65 (D.C. Cir. 1995) (per curiam) ("*Microsoft I*"). Microsoft urges retroactive disqualification of the District Judge, which would entail disqualification antedated to an earlier part of the proceedings and vacatur of all subsequent acts. *Cf. In re School Asbestos Litig.*, 977 F.2d at 786 (discussing remedy options).

"There need not be a draconian remedy for every violation of § 455(a)." *Liljeberg*, 486 U.S. at 862. *Liljeberg* held that a district judge could be disqualified under § 455(a) *after* entering final judgment in a case, even though the judge was not (but should have been) aware of the grounds for disqualification before final judgment. The Court identified three factors relevant to the question whether vacatur is appropriate: "in determining whether a judgment should be vacated for a violation of § 455(a), it is appropriate to consider the risk of injustice to the parties in the particular case, the risk that the denial of relief will produce injustice in other cases, and the risk of undermining the public's confidence in the judicial process." *Id.* at 864. Although the Court was discussing § 455(a) in a slightly different context (the judgment there had become final after appeal and the movant sought to have it vacated under Rule 60(b)), we believe the test it propounded applies as well to cases such as this in which the full extent of the disqualifying circumstances came to light only while the appeal was pending. *See In re School Asbestos Litig.*, 977 F.2d at 785.

Our application of *Liljeberg* leads us to conclude that the appropriate remedy for the violations of § 455(a) is disqualification of the District Judge retroactive only to the date he entered the order breaking up Microsoft. We therefore will vacate that order in its entirety and remand this case to a different District Judge, but will not set aside the existing Findings of Fact or Conclusions of Law (except insofar as specific findings are clearly erroneous or legal conclusions are incorrect).

This partially retroactive disqualification minimizes the risk of injustice to the parties and the damage to public confidence in the judicial process. Although the violations of the Code of Conduct and § 455(a) were serious, full retroactive disqualification is unnecessary. It would unduly penalize plaintiffs, who were innocent and unaware of the misconduct, and would have only slight marginal deterrent effect.

Most important, full retroactive disqualification is unnecessary to protect Microsoft's right to an impartial adjudication. The District Judge's conduct destroyed the appearance of impartiality. Microsoft neither alleged nor demonstrated that it rose to the level of actual bias or prejudice. There is no reason to presume that everything the District Judge did is suspect. *See In re Allied–Signal Inc.*, 891 F.2d 974, 975–76 (1st Cir. 1989); *cf. Liberty Lobby, Inc. v. Dow Jones & Co.*, 838 F.2d 1287, 1301–02 (D.C. Cir. 1988). Although Microsoft challenged very few of the findings as clearly erroneous, we have carefully reviewed the entire record and discern no basis to suppose that actual bias infected his factual findings.

The most serious judicial misconduct occurred near or during the remedial stage. It is therefore commensurate that our remedy focus on that stage of the case. The District Judge's impatience with what he viewed as intransigence on the part of the company; his refusal to allow an evidentiary hearing; his analogizing Microsoft to Japan at the end of World War II; his story about the mule—all of these out-of-court remarks and others, plus the Judge's evident efforts to please the press, would give a reasonable, informed observer cause to question his impartiality in ordering the company split in two.

To repeat, we disqualify the District Judge retroactive only to the imposition of the remedy, and thus vacate the remedy order for the reasons given in Section V and because of the appearance of partiality created by the District Judge's misconduct.

2. Review of Findings of Fact and Conclusions of Law

Given the limited scope of our disqualification of the District Judge, we have let stand for review his Findings of Fact and Conclusions of Law. The severity of the District Judge's misconduct and the appearance of partiality it created have led us to consider whether we can and should subject his factfindings to greater scrutiny. For a number of reasons we have rejected any such approach.

The Federal Rules require that district court findings of fact not be set aside unless they are clearly erroneous. *See* FED. R. CIV. P. 52(a). Ordinarily, there is no basis for doubting that the District Court's factual findings are entitled to the substantial deference the clearly erroneous standard entails. But of course this is no ordinary case. Deference to a district court's factfindings presumes impartiality on the lower court's part. When impartiality is called into question, how much deference is due?

The question implies that there is some middle ground, but we believe there is none. As the rules are written, district court factfindings receive either full deference under the clearly erroneous standard or they must be vacated. There is no *de novo* appellate review of factfindings and no intermediate level between *de novo* and clear error, not even for findings the court of appeals may consider sub-par. *See Amadeo v. Zant*, 486 U.S. 214, 228 (1988) ("The District Court's lack of precision, however, is no excuse for the Court of Appeals to ignore the dictates of Rule 52(a) and engage in impermissible appellate factfinding."); *Anderson v. City of Bessemer City*, 470 U.S. 564, 571–75 (1985) (criticizing district court practice of adopting a party's proposed factfindings but overturning court of appeals' application of "close scrutiny" to such findings).

Rule 52(a) mandates clearly erroneous review of all district court factfindings: "Findings of fact, whether based on oral or documentary evidence, shall not be set aside unless clearly erroneous, and due regard shall be given to the opportunity of the trial court to judge of the credibility of the witnesses." FED. R. CIV. P. 52(a). The rule "does not make exceptions or purport to exclude certain categories of factual findings from the obligation of a court of appeals to accept a district court's findings unless clearly erroneous." *Pullman-Standard v. Swint*, 456 U.S. 273, 287 (1982); *see also Anderson*, 470 U.S. at 574–75; *Inwood Labs., Inc. v. Ives Labs., Inc.*, 456 U.S. 844, 855–58 (1982). The Supreme Court has emphasized on multiple occasions that "[i]n applying the clearly erroneous standard to the findings of a district court sitting without a jury, appellate courts must constantly have in mind that their function is not to decide factual issues *de novo*." *Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100, 123 (1969); *Anderson*, 470 U.S. at 573 (quoting *Zenith*).

The mandatory nature of Rule 52(a) does not compel us to accept factfindings that result from the District Court's misapplication of governing law or that otherwise do not permit meaningful appellate review. *See Pullman–Standard*, 456 U.S. at 292; *Inwood Labs.*, 456 U.S. at 855 n.15. Nor must we accept findings that are utterly deficient in other ways. In such a case, we vacate and remand for further factfinding. *See* 9 MOORE'S FEDERAL PRACTICE § 52.12[1] (Matthew Bender 3d ed. 2000); 9A CHARLES A. WRIGHT & ARTHUR R. MILLER, FEDERAL PRACTICE AND PROCEDURE § 2577, at 514–22 (2d ed. 1995); *cf. Icicle Seafoods, Inc. v. Worthington*, 475 U.S. 709, 714 (1986); *Pullman-Standard*, 456 U.S. at 291–92.

When there is fair room for argument that the District Court's factfindings should be vacated *in toto*, the court of appeals should be especially careful in determining that the findings are worthy of the deference Rule 52(a) prescribes. *See, e.g.*, *Thermo Electron Corp. v. Schiavone Constr. Co.*, 915 F.2d 770, 773 (1st Cir. 1990); *cf. Bose Corp. v. Consumers Union of United States, Inc.*, 466 U.S. 485, 499 (1984). Thus, although Microsoft alleged only appearance of bias, not actual bias, we have reviewed the record with painstaking care and have discerned no evidence of actual bias. *See S. Pac. Communications Co. v. AT & T*, 740 F.2d 980, 984 (D.C. Cir. 1984); *Cooley*, 1 F.3d at 996 (disqualifying district judge for appearance of partiality but noting that "the record of the proceedings below . . . discloses no bias").

In light of this conclusion, the District Judge's factual findings both warrant deference under the clear error standard of review and, though exceedingly sparing in citations to the record, permit meaningful appellate review. In reaching these conclusions, we have not ignored the District Judge's reported intention to craft his factfindings and Conclusions of Law to minimize the breadth of our review. The Judge reportedly told Ken Auletta that "[w]hat I want to do is confront the Court of Appeals with an established factual record which is a fait accompli." AULETTA, WORLD WAR 3.0, at 230. He explained: "part of the inspiration for doing that is that I take mild offense at their reversal of my preliminary injunction in the consent-decree case, where they went ahead and made up about ninety percent of the facts on their own." *Id.* Whether the District Judge takes offense, mild or severe, is beside the point. Appellate decisions command compliance, not agreement. We do not view the District Judge's remarks as anything other than his expression of disagreement with this court's decision, and his desire to provide extensive factual findings in this case, which he did.

VII. CONCLUSION

The judgment of the District Court is affirmed in part, reversed in part, and remanded in part. We vacate in full the Final Judgment embodying the remedial order, and remand the case to the District Court for reassignment to a different trial judge for further proceedings consistent with this opinion.