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DECODING *MICROSOFT*: A FIRST PRINCIPLES APPROACH

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This Article revisits one of the most analytically demanding legal questions in antitrust history: the Microsoft tying claim. In analyzing that claim, the parties, the courts, and most previous commentators failed to formulate a precise definition of a software product and heavily relied on the false and misleading intuition that a software product consists of software code. This Article reviews the D.C. Circuit's adjudication of the Microsoft tying claim and reaches different legal conclusions by applying more precise techniques of antitrust analysis—grounded in first principles of antitrust law, copyright law, and software engineering—to the facts proven at trial. These conclusions indicate that the courts

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should have found Microsoft liable for illegal tying under any of the doctrinal alternatives they considered for adjudicating the claim. Instead, harms to competition from Microsoft's tying conduct that were factually proven at trial have gone unremedied, and Microsoft now enjoys illegitimately acquired monopoly power in the market for Web browser software products.

I. INTRODUCTION

Did Microsoft illegally tie its Web browser software product to its operating system software product? Some eight years after the federal courts of the D.C. Circuit first tentatively considered this crucial question,¹ and seven years after the government began prosecuting its tying claim under section 1 of the Sherman Act,² the *Microsoft* litigation concluded without producing a definitive answer.

Following a high-profile bench trial spanning from October 1998 to June 1999, District Judge Thomas Penfield Jackson issued separate findings of fact³ and conclusions of law⁴ holding Microsoft liable for tying under section 1 of the Sherman Act. In a June 2001 en banc decision, however, the Court of Appeals reversed and remanded the legal question of Microsoft's tying liability for a balancing of anticompetitive harms and procompetitive justifications under the rule of reason.⁵ While upholding Judge Jackson's findings of fact in their entirety,⁶ the Court of Appeals ruled that the government had failed to establish "a precise definition of browsers" and "a careful definition of the tied good market" at trial and would be precluded from doing so on remand.⁷ In the face of these impediments, the government decided in September 2001 to drop the tying claim.⁸ As a result, the claim was never finally

1. *See* United States v. Microsoft Corp., 980 F. Supp. 537, 541-43 (D.D.C. 1997).

2. *See* Complaints, United States v. Microsoft Corp., 84 F. Supp. 2d 9 (D.D.C. 1999) (Nos. 98-1232 & 98-1233).

3. United States v. Microsoft Corp., 84 F. Supp. 2d 9 (D.D.C. 1999).

4. United States v. Microsoft Corp., 87 F. Supp. 2d 30 (D.D.C. 2000).

5. *See* United States v. Microsoft Corp., 253 F.3d 34, 95 (D.C. Cir. 2001).

6. *See* New York v. Microsoft Corp., 224 F. Supp. 2d 76, 98 (D.D.C. 2002) ("Because all of the district court's factual findings survived challenge on appeal, they comprise the law of this case and may be relied upon during the remedy phase of this proceeding.")

7. United States v. Microsoft Corp., 253 F.3d at 95.

8. New York v. Microsoft Corp., 224 F. Supp. 2d at 95 (citing Joint Status

adjudicated.

The significance of the government's failure to pursue the tying claim became apparent during the subsequent remedies proceedings. If the remedies phase of *Microsoft* marked the official end of the "browser wars,"⁹ the terms of District Judge Colleen Kollar-Kotelly's final judgments¹⁰ more closely resembled articles of surrender than a negotiated treaty.¹¹ In a set of November 2002

Report (Sept. 20, 2001) at 2).

9. See, e.g., Iain S. Bruce, *The Browser Wars Are Over and, No Surprise, Microsoft Survives to Fight Another Day*, SUNDAY HERALD (Scotland), Nov. 10, 2002, at P4 (reporting on consequences of final judgments). The browser software product competition between Microsoft Corporation and Netscape Communications Corporation appears to have been referred to as a "war" first in 1995. See James Coates, *Raging Battle of the Browsers; Netscape Vies with Spyglass to Win Web*, CHI. TRIB., July 30, 1995, at C1 ("Call it the battle of the dueling browsers. It's a war for the hearts, the minds and, above all, the money of America as the nation prepares to ride its modems and its set-top cable TV boxes from the Industrial Age into the Information Age."). This competition first became the subject of a government antitrust challenge in a predecessor case alleging contempt of a 1995 consent decree. See Memorandum of the United States in Support of Petition for an Order to Show Cause Why Respondent Microsoft Corporation Should Not Be Found in Civil Contempt, *United States v. Microsoft Corp.*, 1997 WL 656528, at *5 (D.D.C. Oct. 20, 1997) (No. 94-1564) ("The . . . competition between the Microsoft and Netscape browser products has been fierce, so much so that it has frequently been characterized in the industry as the 'browser wars.'").

10. In *United States v. Microsoft Corp.*, the district court conducted Tunney Act public comment proceedings, under 15 U.S.C. § 16(d) (2004), on a proposed consent decree that was jointly submitted by the United States, the nine settling states, and Microsoft Corporation, and issued a final judgment that was substantially the same as the proposed settlement. *United States v. Microsoft Corp.*, 231 F. Supp. 2d 144 (D.D.C. 2002). In *New York v. Microsoft Corp.*, the district court conducted a parallel remedies hearing in which Microsoft submitted the same proposed consent decree as its proposed final judgment. The district court reviewed, and largely rejected, objections to the consent decree from the nine non-settling states and issued a final judgment that was substantially identical to that issued in *United States v. Microsoft Corp.* See *New York v. Microsoft Corp.*, 224 F. Supp. 2d 76 (D.D.C. 2002) (remedies hearing); *New York v. Microsoft Corp.*, 231 F. Supp. 2d 203 (D.D.C. 2002).

11. For other criticism of the settlement, see, for example, HERMAN SCHWARTZ, *THE REHNQUIST COURT: JUDICIAL ACTIVISM ON THE RIGHT* 224 (2002) (describing the Justice Department's settlement with Microsoft as "little more than a Band-Aid, and a Band-Aid of doubtful adhesion, given the difficulties of enforcing the final decree"); John J. Flynn & Darren Bush, *The Misuse and Abuse of the Tunney Act: The Adverse Consequences of the "Microsoft Fallacies"*, 34 LOY. U. CHI. L.J. 749, 786 (2003) ("The opinions of the district court on remedy hewed closely to the narrowest reading of the findings of violation, affirmed by the court of appeals, to prevent a recurrence of the past violations engaged in by Microsoft but did little by way of 'preventing or restraining'

decisions, Judge Kollar-Kotelly ordered several remedies prohibiting Microsoft from thwarting the distribution and installation of non-Microsoft *software code* that might serve to weaken the company's operating systems monopoly.¹² But she rejected several proposed remedies that would have helped to restore competition on the merits among Web browser *software products*, because there was no surviving claim alleging harm to competition in a relevant market for such products.¹³ She also approved a provision that expressly entitled Microsoft to continue to interfere with a Windows user's choice of Web browser software product and other "Non-Microsoft Middleware Products."¹⁴

Remedies that protect the distribution and installation of non-Microsoft software code do not necessarily address competition among software products because software products and software code are not the same. One of the government's computer science expert witnesses, Prof. Edward Felten, went to considerable lengths throughout the trial to clarify the distinction between software products and software code. His efforts were generally met with puzzlement, however, because he was unable to articulate this distinction in legal terms.¹⁵ As a result, the plaintiffs, the district court and the D.C. Circuit all ultimately disregarded Prof. Felten's basic point that "code and products are different things."¹⁶

future violations of the same character or eliminate practices like the bundling of software.").

12. *See infra* Part III.L.

13. *See infra* text accompanying notes 446-70.

14. *See infra* text accompanying notes 434-35.

15. On cross-examination during his rebuttal testimony, Prof. Felten engaged in the following colloquy with Microsoft attorney Steven Holley:

Q. [Holley] Let me see if I can understand that one. You say that you can claim a copyright on software code which is somehow different than the product? . . .

A. [Felten]: I admit I'm not an expert on copyright law, but whether you can—but code and products are different things, as I said many times. So, whether you can copyright code or copyright products, I don't know. I don't see the connection.

Tr. June 10, 1999 p.m. at *95, *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. 1999) (No. CIV A 98-1232(TPJ)) (cross-examination of Edward W. Felten), *available at* 1999 WL 380891.

16. *See infra* Parts III.I.-L. This disconnect between trial attorneys and their computer science experts is apparently a common phenomenon. *See, e.g.*, Victoria Slind-Flor, *Tackling High Tech: Jurists Learn To Cope with the Brave New World*, NAT'L L.J., Oct. 19, 1992, at 1, 28 (quoting a software litigation attorney to the effect that "[t]echnical experts are odd ducks. . . . They are not really controllable. You pay your money, and then they get up there on the witness stand and do what they want to do").

For its part, Microsoft did nothing to prevent this confusion, maintaining throughout the litigation that its “software products consist of code and nothing else.”¹⁷ This position is fundamentally wrong and makes a mockery out of copyright; a person who tried “purchasing” Windows and making and selling pirated copies of the software in the belief that he or she had “bought the code” would promptly be disabused of that notion by Microsoft’s own legal department.¹⁸ This is because the purchaser of a software product does not acquire plenary rights in the accompanying software; rather, he or she is merely endowed with certain limited legal rights and technological capabilities in connection with using a computer system to run the accompanying software. The purchase of a software product is not the purchase of software, but the purchase of these rights and capabilities. A software product market is not a market for software, but a market for these rights and capabilities.

The failure by the government plaintiffs to provide precise definitions of the allegedly tied Web browser software product (that is, not code) and of the relevant market in which that software product competes has been of critical importance to the outcome of the Microsoft litigation.¹⁹ Despite this, the voluminous previous commentary on *Microsoft* is almost devoid of even a reasonably

Software engineering pioneer Charles Ferguson has criticized the Justice Department’s failure to appreciate the significance of technological expertise in modern antitrust enforcement:

The Antitrust Division has roughly 900 employees, about 350 lawyers, and 40 economists. How many technologists? I hear you ask. Zero is the answer. . . . [B]oth the lawyers and economists at Justice guard their turf fiercely, and they certainly don’t want to create a new organization defined precisely by knowledge of important things that they don’t understand at all. Furthermore, there is virtually nobody in the Justice Department with significant industrial experience of *any kind*, never mind experience in a serious high technology company.

CHARLES H. FERGUSON, *HIGH STAKES, NO PRISONERS: A WINNER’S TALE OF GREED AND GLORY IN THE INTERNET WARS* 323 (1999).

17. Defendant Microsoft Corporation’s Revised Proposed Findings of Fact, *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, ¶ 569 (D.D.C. 1999) (No. 98-1232) [hereinafter Microsoft’s Proposed Findings of Fact].

18. *See, e.g., Microsoft Corp. v. CMOS Techs., Inc.*, 872 F. Supp. 1329 (D.N.J. 1994) (granting summary judgment of copyright infringement to Microsoft).

19. *See also* Luanne Sacks & Garrett Dillon, *The Microsoft Decision: A Vivid Reminder That Market Definition Can Make or Break Your Case*, in 22ND ANNUAL INSTITUTE ON COMPUTER LAW 429, 473 (Intellectual Property Course, Handbook Series No. G691, 2002) (“The Circuit Court’s decision strikingly highlights the critical role product and market definition plays in antitrust litigation, particularly in cases involving relatively new industries and technology.”).

accurate working definition of a software product, or of a general approach to defining the relevant market in which a given software product competes, for purposes of antitrust analysis.²⁰

Whether explicitly or implicitly expressed, the fallacious premise that software products consist of code is pervasive in the *Microsoft* literature. Various commentators have referred to the sale of code,²¹ used the terms “software” and “software product” interchangeably,²² and attempted to describe the code that comprises Microsoft’s Windows and Internet Explorer (“IE”) software products.²³ Others have written about the “unitary” nature or the

20. A qualified exception is Prof. Lawrence Lessig’s valid but imprecise definition of a software product as “functionality separately valued by consumers.” See Brief of Professor Lawrence Lessig as Amicus Curiae at 20, *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. 1999) (No. 98-1232); see also *infra* text accompanying notes 78-85 (comparing Prof. Lessig’s definition with this Article’s approach).

21. See Michael L. Katz & Carl Shapiro, *Antitrust in Software Markets*, in COMPETITION, INNOVATION AND THE MICROSOFT MONOPOLY: ANTITRUST IN THE DIGITAL MARKETPLACE 29, 66 (Jeffrey A. Eisenach & Thomas M. Lenard eds., 1999) (defining the tying of software products “carefully” as the refusal “to sell program A (the ‘tying’ good) unless the customer also purchases program B (the ‘tied’ good)”; *id.* at 76 (noting that a possible antitrust response to *Microsoft* would be “a policy of requiring a modular approach to the production and sale of code, with well-defined, open interfaces between the modules”); George L. Priest, *Letter to Larry*, INDUSTRY STANDARD, June 26, 2000 (“Judge Jackson concluded that it is predatory for Microsoft to include Internet Explorer in Windows and to not charge extra for the added browser code.”).

22. See DEBORA L. SPAR, RULING THE WAVES: CYCLES OF DISCOVERY, CHAOS, AND WEALTH FROM THE COMPASS TO THE INTERNET 316 (2001) (stating that Microsoft’s tying liability depends “on whether the market for browsing software is fundamentally separate from the market for operating system software, and whether consumer welfare is helped or harmed by having the two products provided by the same firm”); Janusz A. Ordover & Robert D. Willig, *Access and Bundling in High-Technology Markets*, in COMPETITION, INNOVATION AND THE MICROSOFT MONOPOLY: ANTITRUST IN THE DIGITAL MARKETPLACE 103, 121 (Jeffrey A. Eisenach & Thomas M. Lenard eds., 1999) (describing Windows 98 as “a new product that, in effect, combines both the operating system software and the browser software into one technologically inseparable product”); David K. Lam, Case Note, *Revisiting the Separate Products Issue*, 108 YALE L.J. 1441, 1446-47 (1999) (“Microsoft can easily offer the two products separately because ‘[s]oftware code by its nature is susceptible to division and combination.’” (quoting *United States v. Microsoft Corp.*, 147 F.3d 935, 951 (D.C. Cir. 1998))).

23. See David S. Evans, *All the Facts That Fit: Square Pegs and Round Holes in U.S. v. Microsoft*, REG., Winter 1999, at 61 (“[T]he court does not mention . . . the evidence . . . that the presence of software code that is within the court’s apparent definition of ‘IE’ supports an improved ‘Help’ system for Windows itself and provides other benefits to Windows users.”); Mark A. Lemley & David McGowan, *Could Java Change Everything? The Competitive*

“integration” of software products and the functionalities they provide, when they were actually referring to the combination and sharing of software code.²⁴

Propriety of a Proprietary Standard, in Second Annual Internet Law Institute 453, 476 (PLI Patents, Copyrights, Trademarks, and Literary Property Course Handbook, Series No. 520, 1998) (“The conclusion that Internet Explorer and Windows are separate products is therefore not self-evident; still less is it static. Like all software, browsers are, at bottom, binary code arranged in files, as is the operating system. To the extent Internet Explorer is a different product from Windows 95, it is because the sequences of 0’s and 1’s that perform ‘browser functions’ differ from the sequences of 0’s and 1’s that perform ‘Windows 95 functions.’”).

24. See DAVID B. KOPEL, ANTITRUST AFTER MICROSOFT: THE OBSOLESCENCE OF ANTITRUST IN THE DIGITAL ERA 87 (2001) (“Even if Netscape had not existed, it would have been eminently sensible for Microsoft to develop Internet Explorer and integrate it into Windows.”); RICHARD A. POSNER, ANTITRUST LAW 207 (2d ed. 2001) (describing Microsoft’s “computer operating system and its browser functionality” as being “physically integrated”); RICHARD A. SPINELLO, REGULATING CYBERSPACE: THE POLICIES AND TECHNOLOGIES OF CONTROL 91 (2002) (“The conclusion that bundling Windows and IE was illegal tying and not just product integration is surely not obvious.”); Charles M. Gastle & Susan Boughs, *Microsoft III and the Metes and Bounds of Software Design and Technological Tying Doctrine*, 6 VA. J.L. & TECH. 7, 29-30 (2001) (“The antitrust concern is that the [tying and tied products]—separate in nature even if they are functionally linked—are joined contractually. . . . [T]he analysis should change if the difference is eliminated, such that the underlying economic activity giving rise to the antitrust concern, is unitary—precisely and exactly the same object—but exhibiting different characteristics in a manner suggesting participation in two separate markets.”); Keith N. Hylton & Michael Salinger, *Tying Law and Policy: A Decision-Theoretic Approach*, 69 ANTITRUST L.J. 469, 479 (2001) (arguing that “technological tying” should be condemned only where “the defendant integrated the two products for the sole purpose of hampering competition, rather than to produce some additional utility to consumers.” (citing *Response of Carolina, Inc. v. Leasco Response, Inc.*, 537 F.2d 1307 (5th Cir. 1976))); Benjamin Klein, *An Economic Analysis of Microsoft’s Conduct*, ANTITRUST, Fall 1999, at 38, 40 (“[T]he important economic question is whether Microsoft’s integration of IE in Windows made Navigator unreasonably difficult to use [D]istribution of IE integrated in Windows clearly does not, by itself, foreclose competing browsers.”); Lemley & McGowan, *supra* note 23, at 476 (“When a truly integrated operating system (in which browser functions are inextricably interwoven) comes to market, the lines of code that perform the ‘browser’ function will still differ from the rest of the operating system code; they will merely have been written (temporally) as part of a single version of the operating system, not as an ex post addition.”); Thomas M. Lenard, *Creating Competition in the Market for Operating Systems: Alternative Structural Remedies in the Microsoft Case*, 9 GEO. MASON L. REV. 803, 827 (2001) (“The integration of Internet Explorer into the leading Windows products is now a fait accompli.”); Thomas A. Piraino, Jr., *A Proposed Antitrust Approach to High Technology Competition*, 44 WM. & MARY L. REV. 65, 105 (2002) (“Microsoft’s integration of the browser and operating system was

Given this widespread imprecision in the use of the term “software product,” it is not surprising that many commentators also mischaracterized the specific conduct challenged under the *Microsoft* tying claim,²⁵ which alleged that Microsoft illegally conditioned the sale of one “software product” on the purchase of another. These mischaracterizations led supporters of Microsoft’s position on tying to defend conduct that had been neither challenged nor condemned under the tying claim.²⁶ By incorrectly equating a

motivated by a desire to improve its product Indeed, consumers have benefited greatly from Microsoft’s integration of various Web features into its operating system.”); Lawrence J. White, *Microsoft and Browsers: Are the Antitrust Problems Really New?*, in *COMPETITION, INNOVATION AND THE MICROSOFT MONOPOLY: ANTITRUST IN THE DIGITAL MARKETPLACE* 137, 148 (Jeffrey A. Eisenach & Thomas M. Lenard eds., 1999) (“Microsoft apparently intends to sell its Windows 98 operating system and its browser as a completely integrated package, with the two being technologically inseparable (and, of course, not being sold separately).”); Renato Mariotti, Note, *Rethinking Software Tying*, 17 *YALE J. ON REG.* 367, 385-86 (2000) (“Allowing the integration of Internet Explorer into Windows . . . is as much a design decision as preventing integration.”); Samuel Noah Weinstein, Note, *United States v. Microsoft Corp.*, 17 *BERKELEY TECH. L.J.* 273, 273 (2002) (“The most pressing worry is that Microsoft will use its monopoly power in operating systems to quash innovation in other software markets by ‘integrating’ formerly competitive functions into Windows.”); *id.* at 294 (“[A] structured rule is needed to make the bounds of legal integration clear.”).

25. See *infra* Part IV.E (identifying the specific conduct challenged under the tying claim and characterizing it as an understood tying condition).

26. See RICHARD L. GORDON, *ANTITRUST ABUSE IN THE NEW ECONOMY: THE MICROSOFT CASE* 129 (2002) (“Including a browser as a component of Windows without a price increase and vigorously seeking to improve and promote that browser are not conventional predatory acts.”); STAN J. LIEBOWITZ & STEPHEN E. MARGOLIS, *WINNERS, LOSERS & MICROSOFT: COMPETITION AND ANTITRUST IN HIGH TECHNOLOGY* 254 (1999) (“[T]he software industry has very important nonpredatory reasons to bundle functions into operating systems and other software products.”); ALAN REYNOLDS, *THE MICROSOFT ANTITRUST APPEAL: JUDGE JACKSON’S “FINDINGS OF FACT” REVISITED* 124 (2001) (“[The tying claim] asks us to believe that extra features must never be integrated into the Windows operating system at no extra charge. . . . The tying charge in this case is a very good example of a very bad idea—the idea that there is something wrong with making a product more marketable by adding more features.”); George Bittlingmayer, *U.S. v. Microsoft: Cui Bono?*, 9 *CORNELL J.L. & PUB. POLY* 9, 22 (1999) (“‘Bundling’ or integrating the browser with the operating system offers the prospect of easier-to-use products. Since the extra cost of the bundled browser was zero, consumers come out ahead.”); Dennis W. Carlton, *A General Analysis of Exclusionary Conduct and Refusal to Deal—Why Aspen and Kodak Are Misguided*, 68 *ANTITRUST L.J.* 659, 682 (2001) (“[T]he second tie-in claim involved the physical commingling of the code of Internet Explorer and Windows together.”); Dennis W. Carlton, *The Lessons from Microsoft*, *BUS. ECON.*, Jan. 2001, at 47, 52 (“Recall that Microsoft was challenged for making

consumer's acquisition of a software product with the *installation* of software code on a computer's hard drive, Microsoft's advocates also disregarded well-founded challenges to the company's interference

the code of Windows and IE inseparable (a physical tie-in.); Ronald A. Cass & Keith N. Hylton, *Antitrust Intent*, 74 S. CAL. L. REV. 657, 717 (2001) ("Microsoft integrated its Internet Explorer web-browser technology into Windows rather than selling it solely on a stand-alone basis. That decision increased consumer access to browsing software and reduced the cost of such software. . . ."); Ronald A. Cass & Keith N. Hylton, *Preserving Competition: Economic Analysis, Legal Standards and Microsoft*, 8 GEO. MASON L. REV. 1, 21-22 (1999) ("Integration of Internet Explorer into Windows to offer additional, attractive functions follows the same approach as Microsoft's integration of numerous other software technologies into Windows. . . . Simply put, the firm makes money not by selling every possible stand-alone product separately but by integrating the most attractive complementary features into the operating system and encouraging consumers to become familiar with those features."); Nicholas Economides, *United States v. Microsoft: A Failure of Antitrust in the New Economy*, 32 UWLA L. REV. 3, 30 (2001) ("[A]dding IE functionality to new versions of Windows and distributing IE free of charge for older versions of Windows and for other operating systems did not harm consumers."); David S. Evans & Richard L. Schmalensee, *Be Nice to Your Rivals: How the Government is Selling an Antitrust Case Without Consumer Harm in United States v. Microsoft*, in DID MICROSOFT HARM CONSUMERS? TWO OPPOSING VIEWS 45, 73 (2000) ("Microsoft invested in improving its profitable software platform by adding features and functionality. . . . After the investment, the platform was plainly better and still highly profitable."); Thomas W. Hazlett, *Microsoft's Internet Exploration: Predatory or Competitive?* 9 CORNELL J.L. & PUB. POL'Y 29, 44-45 (1999) ("Microsoft's strategy to bundle its browser with Windows is easily explained as a way to overcome the disadvantages of Netscape's embedded base: Purchasers of new computers could access Internet Explorer easily and try it out, lowering switching costs, pumping demand. Microsoft's concurrent tactics—spending aggressively to upgrade the quality of Internet Explorer, and pricing it at zero—reinforced this effort. All three Microsoft policies increased the value of their product for users."); Dwight R. Lee & Richard B. McKenzie, *A Case for Letting a Firm Take Advantage of "Locked-In" Customers*, 52 HASTINGS L.J. 795, 798 (2001) (describing the Justice Department's case as based on the claim that Microsoft engaged in predatory pricing "by giving away Internet Explorer, and by integrating Internet Explorer into Windows at no additional cost"); John E. Lopatka & William H. Page, *Monopolization, Innovation, and Consumer Welfare*, 69 GEO. WASH. L. REV. 367, 401 (2001) ("At a minimum, the bundling provided those users of Windows who preferred IE or were indifferent between browsers with the convenience of preinstalled browsing functionality, without hurting those who preferred Navigator."); STEVEN J. DAVIS ET AL., *ECONOMIC PERSPECTIVES ON SOFTWARE DESIGN: PC OPERATING SYSTEMS AND PLATFORMS* 78 (Nat'l Bureau of Econ. Research, Working Paper No. 8411, 2001) ("In short, our analysis indicates that the integration and bundling of new features and functions into PC operating system products have been highly beneficial for consumers and a major stimulus to growth and innovation in the computer industry.") available at <http://www.nber.org/papers/w8411>.

with the *use* of non-Microsoft software products.²⁷

In a companion article,²⁸ I have developed legally sufficient, generally applicable procedures for identifying the legal rights and technological capabilities that constitute a software product and for delineating the relevant market or markets in which a given software product competes. Because these techniques are grounded in basic software engineering concepts and prevailing copyright and antitrust doctrines, I refer to them collectively as the *first principles approach* to antitrust analysis.

This Article does not propose any changes to existing law. Instead, the purpose of this Article is to conduct a legal analysis of the *Microsoft* tying claim while adhering to the first principles approach. This Article therefore serves in part as a response to the pervasive imprecision in previous treatments of the tying claim.

27. See David S. Evans & Richard L. Schmalensee, *Consumers Lose If Leading Firms Are Smashed for Competing*, in DID MICROSOFT HARM CONSUMERS, *supra* note 26, at 102 (2000) (“Netscape could and did enter into agreements with OEMs to include its browsing software on new computers. Consumers could and did install Navigator on Windows machines, just as they installed many other applications.”); Daniel J. Gifford, *Java and Microsoft: How Does the Antitrust Story Unfold?*, 44 VILL. L. REV. 67, 104 (1999) (“[S]o long as Microsoft allows computer manufacturers to install non-Microsoft browsers in addition to the Explorer, it is difficult to identify foreclosure. The manufacturer is free to install whatever additional browser it wishes, and when the manufacturer installs an additional browser consumers will have the ultimate choice as to which browser to use.”); Robert W. Hahn, *The Costs of Regulating Microsoft*, REG., Summer 1998, at 62, 63 (stating that “[t]he practices [challenged under the tying claim] include Microsoft’s giving its browser away, not allowing computer manufacturers to delete the Explorer icon from the Microsoft operating system, and various other practices that allegedly favor the Explorer,” but nowhere identifying the “other practices”); John E. Lopatka & William H. Page, *Antitrust on Internet Time: Microsoft and the Law and Economics of Exclusion*, 7 SUP. CT. ECON. REV. 157, 209 (1999) (“[T]he tie of IE and Windows does not cause anticompetitive exclusion in the usual way, by forcing buyers to accept a product that they do not want in place of a product that they do want, because it imposes no financial or technical obstacle to using both.”); William H. Page & John E. Lopatka, *The Dubious Search for “Integration” in the Microsoft Trial*, 31 CONN. L. REV. 1251, 1271 (1999) (“The combination of IE and Windows 98 involves a substantial consumer benefit without any apparent forcing of consumer choice. . . . [I]t does not block their use of other browsers.”); Max Schanzenbach, *Network Effects and Antitrust Law: Predation, Affirmative Defenses, and the Case of U.S. v. Microsoft*, 2002 STAN. TECH. L. REV. 4, ¶ 85 (“Consumers and OEMs were still free to install Netscape Navigator, which was free via downloads and over 100 million mass mailings per year.”).

28. Andrew Chin, *Antitrust Analysis in Software Product Markets: A First Principles Approach*, 18 HARV. J.L. & TECH. 1 (2004) [hereinafter *Antitrust Analysis*].

The analysis in this Article will show that the facts proven at trial could have supported a legal conclusion of tying liability under any of the alternative doctrines that were considered by the district court and the Court of Appeals. All that would have been required were more precise characterizations of software products and the markets in which they compete, rather than imprecise intuitions and analogies. Instead, harms to competition from Microsoft's tying conduct that were factually proven at trial (and that still constituted the law of the case throughout the remedy proceedings)²⁹ may go unremedied solely because of failures by the plaintiffs and the courts to take the role of computer science as seriously as the role of economic theory in the antitrust analysis of software product markets.³⁰

The remainder of this Article is organized as follows. Part II introduces the first principles approach by summarizing the conclusions of the companion article.³¹ Specifically, it presents an accurate description of the legal rights and technological capabilities that constitute a software product³² and a legally sufficient, generally applicable procedure for delineating the relevant market or markets in which a given software product competes.³³ It also compares these approaches to the definition of a software product suggested in Prof. Lessig's amicus brief.³⁴

Part III reviews the litigation history of the *Microsoft* tying claim in sufficient detail to spell out, and identify inconsistencies in, the courts' positions on the applicable legal doctrines and on the legal significance of the underlying facts. After a brief summary of tying and monopoly leveraging doctrines,³⁵ it reviews the previous litigation in the D.C. Circuit relating to the 1994 consent decree between the Justice Department and Microsoft, which influenced the adjudication of the *Microsoft* tying claim.³⁶ It then discusses the *Microsoft* trial court proceedings relating to the tying claim, including the government's complaint,³⁷ Microsoft's motion for

29. *New York v. Microsoft Corp.*, 224 F. Supp. 2d 76, 98 (D.D.C. 2002) ("Because all of the district court's factual findings survived challenge on appeal, they comprise the law of this case and may be relied upon during the remedy phase of this proceeding.").

30. *See supra* note 16 and accompanying text.

31. *Antitrust Analysis*, *supra* note 28.

32. *See infra* Part II.A.

33. *See infra* Part II.B.

34. *See infra* Part II.C.

35. *See infra* Parts III.A.-B.

36. *See infra* Parts III.C.-D.

37. *See infra* Part III.E.

summary judgment,³⁸ the trial proceedings,³⁹ and the issuance of Judge Jackson's findings of fact,⁴⁰ conclusions of law,⁴¹ and final judgment.⁴² Next, it examines the D.C. Circuit's analysis and disposition of the tying claim,⁴³ which led to the plaintiffs' decision to drop the claim on remand.⁴⁴ Finally, to the limited extent that some of the proposed remedies on remand addressed the inclusion of a Web browser software product in Windows 98, it discusses the remedial proceedings before Judge Kollar-Kotelly⁴⁵ and the D.C. Circuit.⁴⁶

Part IV revisits the question of Microsoft's tying liability by deriving a new set of legal conclusions from Judge Jackson's findings of fact relating to the tying claim while adhering to the first principles approach. It begins by identifying the tying and tied products in Windows 98⁴⁷ and the markets in which they compete.⁴⁸ It then addresses the question of whether the tying claim involves two separate products, considering each of the various alternative doctrines concerning this issue in turn.⁴⁹ Next, it considers whether the specific conduct challenged under the tying claim constituted a tying condition.⁵⁰ It completes the liability analysis under both the per se rule and the rule of reason by assessing the foreclosure and anticompetitive effect from,⁵¹ and reviewing Microsoft's proffered justifications for,⁵² the challenged tie. Finally, it summarizes this analysis⁵³ and considers the implications for the related monopoly leveraging claim⁵⁴ and for the remedial proceedings.⁵⁵

Part V examines the adjudication of the *Microsoft* tying claim in the larger context of antitrust jurisprudence. It contends that the D.C. Circuit's approach to the *Microsoft* tying claim was a drastic and unwarranted departure from previous tying doctrine, even in

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38. *See infra* Part III.F.
 39. *See infra* Part III.G.
 40. *See infra* Part III.H.
 41. *See infra* Part III.I.
 42. *See infra* Part III.J.
 43. *See infra* Part III.K.
 44. *See infra* text accompanying notes 413-14.
 45. *See infra* Part III.L.
 46. *See infra* Part III.M.
 47. *See infra* Part IV.A.
 48. *See infra* Parts IV.B.-C.
 49. *See infra* Part IV.D.
 50. *See infra* Part IV.E.
 51. *See infra* Part IV.F.
 52. *See infra* Part IV.G.
 53. *See infra* Part IV.H.
 54. *See infra* Part IV.I.1.
 55. *See infra* Part IV.I.2.

light of the ongoing retrenchment of the per se rule.⁵⁶ It argues that the adjudication of *Microsoft* ultimately forced Judge Kollar-Kotelly to engage in software design, a result that could have been avoided by the first principles approach.⁵⁷ Finally, it addresses claims of antitrust's obsolescence in the wake of *Microsoft*.⁵⁸

II. THE FIRST PRINCIPLES APPROACH

A. Terminology

A *software product* is defined by reference to accompanying software and documentation and consists essentially of the necessary *legal rights*, and *technological capabilities*, to install and run the software on a system according to the documentation; it does not include any of the software code or documentation.⁵⁹

The necessary *legal rights* consist essentially of a limited, nonexclusive license to make copies and adaptations of the software code on a computer's hard drive and in the computer's memory during the course of using the software product for the consumer purpose(s) for which it was sold and purchased. These rights are granted to the consumer by express contractual provisions (for example, by the terms of a software license agreement) and, where the consumer is an "owner of a copy" of the software, by the statutory adaptation exemption of section 117 of the Copyright Act.⁶⁰

The necessary *technological capabilities* refer essentially to an end user's ability, by installing and running the software on a system according to the documentation, to cause the creation of processes in random access memory that generate system behavior for supporting the consumer purpose(s) for which the software product was sold and purchased.⁶¹

B. Software Product Markets

The following procedure can be used to define the relevant product market in which a defendant's software product competes.

1. Define the Defendant's Product

A software product is defined by reference to accompanying software and documentation, and consists essentially of the

56. See *infra* Part V.A.

57. See *infra* Part V.B.

58. See *infra* Part V.C.

59. See *Antitrust Analysis, supra* note 28, at 25-28.

60. See *id.* at 56-72.

61. See *id.* at 66-71.

necessary legal rights and technological capabilities to install and run the software on a system according to the documentation.⁶²

2. *List Relevant Consumer Purposes for the Defendant's Product*

The list should consist of consumer purposes for the defendant's product that are relevant to the challenged practice and complete, meaningful, and well-defined from the user's perspective.⁶³ Consumer purposes may include (a) tasks supported by the defendant's product and (b) the satisfaction of preconditions for running other software products by the acquisition of the defendant's product and the preinstallation of its accompanying platform software.⁶⁴

The list need not include all consumer purposes served by the defendant's product. Since "functional interchangeability does not require complete identity of use,"⁶⁵ the list need not be comprehensive, but might be limited to the product's primary end use or uses. Alternatively, it may consist of a single end use that could be targeted for price discrimination where the challenged practice has been alleged to affect competition among products serving that end use.⁶⁶ Such price discrimination is possible, for example, if it specifically accounts for some significant part of the consumer demand for the product⁶⁷ and if a hypothetical monopolist would have the ability to discriminate against the end use by reducing the quality of the product significantly below a competitive level with respect to that end use only.⁶⁸

3. *Represent Any Relevant Tasks as Essential Use Cases*

Each relevant task should be characterized in the form of an essential use case—a structured narrative, expressed in the language of the application domain and of users, comprising a simplified, generalized, abstract, technology-free, and implementation-independent description of the user-system interaction that supports the task.⁶⁹

62. *See id.* at 25-28.

63. *See id.* at 18, 28.

64. *See id.* at 27.

65. *United States v. Charles Pfizer & Co.*, 246 F. Supp. 464, 468 (E.D.N.Y. 1965).

66. *See Antitrust Analysis, supra* note 28, at 15-19.

67. *See id.* at 18.

68. *See id.* at 21-24.

69. *See id.* at 28-32.

4. Identify Products That Are Functionally Interchangeable with the Defendant's Product for the Relevant Consumer Purposes

A product should be deemed functionally interchangeable with the defendant's product if it serves any of the consumer purposes identified in step 2, as characterized in step 3.⁷⁰

5. List Relevant Competitive Variables

Competitive variables include material preference and performance metrics with respect to each relevant task, and material preconditions for using the defendant's product.⁷¹ A factor is material if it would normally determine the user's choice or preference of a software product for the relevant end use.⁷²

6. Identify Products That Are Reasonably Interchangeable with the Defendant's Product for the Relevant Consumer Purposes

The reasonable interchangeability analysis begins with a provisional market consisting of the defendant's product and proceeds by iteratively extending the boundaries of the provisional market to include additional products that are reasonably interchangeable with the products already found to be in the provisional market.⁷³ A product identified in step 4 as functionally interchangeable with the defendant's product is reasonably interchangeable if, given consumer preferences with respect to the competitive variables identified in step 5, consumers would respond to a quality-adjusted price increase above a competitive level by a hypothetical monopolist of the provisional market by switching to the functionally interchangeable product in sufficient volume so as to make such a price increase unprofitable.⁷⁴ This iterative process should continue until no more reasonably interchangeable products can be added to the provisional market.⁷⁵

7. Identify Structural Barriers to Entry

The software product market definition procedure concludes by identifying producers that could respond to a price increase above a competitive level by a hypothetical monopolist of the provisional market by making and selling any of the incumbent products identified in step 6, or a reasonably interchangeable new product, in

70. *See id.* at 32.

71. *See id.* at 32-34.

72. *See id.* at 32.

73. *See id.* at 10-14.

74. *See id.* at 12, 32.

75. *See id.* at 10-11.

sufficient volume so as to make such a price increase unprofitable.⁷⁶ This analysis should account for structural barriers to entry into the product market that may arise from the technological difficulty of designing a functionally and reasonably interchangeable new product, such as exclusionary preconditions, proprietary platform software, and interference from preinstalled software,⁷⁷ as well as difficulties in achieving product acceptance.

C. *Comparison with Professor Lessig's Approach*

In *Microsoft*, Stanford Law Prof. Lawrence Lessig filed an amicus brief concluding that, at least in the tying context, “a ‘software product’ should be viewed as ‘functionality separately valued by consumers.’”⁷⁸ Prof. Lessig found support for this definition from “the economic purpose of the inquiry,” which in a tying case is the aim of assuring “that the public, acting through the market’s impersonal judgment, shall allocate the Nation’s resources and thus direct the course its economic development will take.”⁷⁹

Prof. Lessig’s characterization of a software product as “functionality” is basically correct, inasmuch as it implicitly embraces the legal rights and technological abilities that are necessary to confer that functionality to a consumer. As a working definition for purposes of antitrust analysis, however, it is deficient in several respects. First, Prof. Lessig’s definition fails to account for the separate value that a software product may provide to consumers in using the accompanying software as platform software.⁸⁰ Second, the “separately valued by consumers” criterion is more appropriately framed as part of the *Jefferson Parish* separate products inquiry in a per se tying analysis⁸¹ than as a defining characteristic of a software product. Third, Prof. Lessig did not specify the level of abstraction at which a software product’s “functionality” should be characterized for purposes of a market definition analysis. Fourth, the D.C. Circuit, Judge Kollar-Kotelly, and even Judge Jackson (who had personally requested Prof. Lessig’s advice) ultimately did not find Prof. Lessig’s characterization sufficiently explicit and detailed as to dissuade

76. *See id.* at 24-25.

77. *See id.* at 35-37.

78. Brief of Amicus Curiae Professor Lawrence Lessig at 20, *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. 1999) (No. 98-1232) *available at* <http://cyberlaw.stanford.edu/lessig/content/testimony/ab/ab.pdf>.

79. *Id.* (citing *Times-Picayune Publ'g Co. v. United States*, 345 U.S. 594, 605 (1953)).

80. *See generally Antitrust Analysis, supra* note 28, at 25-28 (explaining the consumer purposes served by a software product).

81. *See infra* text accompanying notes 633-38.

them from relying on the intuition that software products consist of code.⁸²

Finally, it seems an unnecessary indulgence to derive a definition for a key term in a legal analysis inductively from a claim that the outcome will comport with certain normative public policy objectives (for example, protecting consumer sovereignty in “allocat[ing] the Nation’s resources”⁸³). By proceeding deductively from first principles of software engineering and antitrust market definition, I have been able to obtain a more informative and positive exegesis of software products and the product markets in which they compete.⁸⁴ I have also reached different legal conclusions from those of Prof. Lessig regarding the *Microsoft* tying claim.⁸⁵

III. THE ADJUDICATION OF THE *MICROSOFT* TYING CLAIM

Of the various claims in *Microsoft*, the longest pedigree belongs to the government’s contention that Microsoft’s marketing of Windows 98 constituted, in part, an illegal tying arrangement. For several years prior to the case, the government had sought to obtain and enforce a consent decree barring Microsoft from licensing its software under tying conditions. Even though this consent decree was not at issue in *Microsoft*, its interpretation in proceedings before the district court and the Court of Appeals for the District of Columbia had an enduring and ultimately confounding influence on those courts’ adjudication of the *Microsoft* tying claim. Before embarking on a critical assessment of that adjudication, it is therefore necessary to trace the courts’ and parties’ analyses of the tying claim from their conceptual origins in the consent decree proceedings to the final resolution of the case. First, however, I will review the relevant doctrines.

A. *Tying Defined*

A tying arrangement exists when a seller conditions the sale of one product (the “tying product”) on the buyer’s purchase of another product (the “tied product”). Where the seller has market power in the tying product, a tying arrangement may have the effect of foreclosing consumers from purchasing the tied product from other sellers and thereby injuring competition in the tied product

82. See generally *infra* Parts III.I.-L (reviewing Judge Jackson’s conclusions of law, the D.C. Circuit’s en banc decision, and Judge Kollar-Kotelly’s remedies proceedings).

83. Lessig, *supra* note 78, at 19 (quoting *Times-Picayune Publ’g Co.*, 345 U.S. at 605).

84. See *Antitrust Analysis*, *supra* note 28, at 9-73.

85. See *infra* text accompanying notes 670-72.

market.⁸⁶

Tying arrangements may be challenged as unreasonable restraints of trade under section 1 of the Sherman Act⁸⁷ and, more specifically, as leases or sales on unreasonable conditions under section 3 of the Clayton Act.⁸⁸ The Federal Trade Commission ("FTC") also has authority to challenge tying arrangements under section 5 of the FTC Act.⁸⁹ With few exceptions, the substantive standard for illegality is the same under all three statutes.⁹⁰

Certain tying arrangements are subject to condemnation under a per se rule of illegality.⁹¹ In general, a tying arrangement is per se unlawful if (1) it involves two separate products; (2) the sale of one product (the "tying product") is conditioned on the purchase of the other (the "tied product"); (3) the seller has sufficient market power in the tying product market to enable it to restrain trade in the tied product market; and (4) the arrangement affects a not insubstantial amount of interstate commerce in the tied product market.⁹² In

86. *See, e.g.*, *N. Pac. Ry. Co. v. United States*, 356 U.S. 1, 6 (1958) ("[Tying arrangements] deny competitors free access to the market for the tied product, not because the party imposing the tying requirements has a better product or a lower price but because of his power or leverage in another market.").

87. 15 U.S.C. § 1 (2004).

88. *Id.* (prohibiting tying and exclusive dealing arrangements involving "goods, wares, merchandise, machinery, supplies, or other commodities . . . where the effect . . . may be to substantially lessen competition or tend to create a monopoly in any line of commerce").

Although tying arrangements involving software products have been held unlawful under section 3, *see, e.g.*, *Digidyne Corp. v. Data Gen. Corp.*, 734 F.2d 1336 (9th Cir. 1984), the courts have not specifically addressed the question of whether software products come within the scope of section 3. *See, e.g.*, *In re Data Gen. Corp. Antitrust Litig.*, 490 F. Supp. 1089, 1100 n.10 (N.D. Cal. 1980) (declining to reach question); *see also* HERBERT HOVENKAMP ET AL., *IP AND ANTITRUST: AN ANALYSIS OF ANTITRUST PRINCIPLES APPLIED TO INTELLECTUAL PROPERTY LAW* § 21.1, at 21-6 (2003) (stating that section 3 by its terms does not apply to "simple [intellectual property] license[s]," but noting that "the presence of copyrights or trademarks has never been regarded as a defense to a tying arrangement").

89. 15 U.S.C. § 45.

90. *See* ABA SECTION OF ANTITRUST LAW, *ANTITRUST LAW DEVELOPMENTS* 177 n.957 (4th ed. 1997) (citing cases); IX PHILLIP A. AREEDA ET AL., *ANTITRUST LAW* ¶¶ 1719b-c, at 254-57 (1997); HOVENKAMP ET AL., *supra* note 88, § 21.1.

91. *See* *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 9 (1984) ("It 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.'").

92. *See* *Fortner Enters., Inc. v. U.S. Steel Corp.*, 394 U.S. 495, 499 (1969) ("[Tying arrangements] are unreasonable in and of themselves whenever a party has sufficient economic power with respect to the tying product to appreciably restrain free competition in the market for the tied product and a 'not insubstantial' amount of interstate commerce is affected."); *N. Pac. Ry. Co.*

addition, the Supreme Court has stated that “as a threshold matter there must be a substantial potential for impact on competition in order to justify *per se* condemnation,”⁹³ and many lower courts, though not yet those in the D.C. Circuit,⁹⁴ have required a showing of “anticompetitive effects” in the tied product market.⁹⁵

Under the doctrine set forth by the Supreme Court in *Jefferson Parish*, two separate products exist “if there is ‘sufficient consumer demand so that it is efficient for a firm to provide’ them separately . . . even if the products are ‘functionally linked’ so that one is ‘useless without the other.’”⁹⁶ A separate line of cases involving challenges to the combination of previously separately marketed products through physical integration or product design, however, hold that such “technological tying” claims can succeed only if the plaintiff can show that “the challenged combination was carried out *solely* for the purpose of tying two separate products together ‘rather than to achieve some technologically beneficial result.’”⁹⁷

Tying arrangements that are not shown to be *per se* unlawful may still be found unreasonable, and therefore illegal, after a more

v. U.S., 356 U.S. 1, 6 (1958) (same).

93. *Jefferson Parish*, 466 U.S. at 16.

94. *See, e.g.*, *United States v. Microsoft Corp.*, 253 F.3d 34, 85 (D.C. Cir. 2001) (listing only the four generally accepted elements of *per se* illegal tying).

95. *See* *United Farmers Agents Ass’n, v. Farmers Ins. Exch.*, 89 F.3d 233, 236 n.2 (5th Cir. 1996); *Gonzalez v. St. Margaret’s House Hous. Dev. Fund Corp.*, 880 F.2d 1514, 1516-17 (2nd Cir. 1989); *Wells Real Estate, Inc. v. Greater Lowell Bd. of Realtors*, 850 F.2d 803, 815 (1st Cir. 1988); *Power Test Petroleum Distribs., Inc. v. Calcu Gas, Inc.*, 754 F.2d 91, 96 (2nd Cir. 1985); *Shop & Save Food Mkts. v. Pneumo Corp.*, 683 F.2d 27, 30 (2nd Cir. 1982); *Yentsch v. Texaco, Inc.*, 630 F.2d 46, 56-57 (2nd Cir. 1980); *Coniglio v. Highwood Servs., Inc.*, 495 F.2d 1286, 1289 (2nd Cir. 1974); *Driskill v. Dallas Cowboys Football Club, Inc.*, 498 F.2d 321, 323 (5th Cir. 1974). *But see* *Amey, Inc. v. Gulf Abstract & Title, Inc.*, 758 F.2d 1486, 1503 (11th Cir. 1985) (“A claim that a tying arrangement is illegal *per se* eliminates the requirement that the plaintiff show an actual anti-competitive effect.”).

96. *United States v. Microsoft Corp.*, No. CIV.A. 98-1232, 1998 WL 614485, at *7 (D.D.C. Sept. 14, 1998) (quoting *Eastman Kodak Co. v. Image Technical Servs., Inc.*, 504 U.S. 451, 462 (1992)); *Jefferson Parish*, 466 U.S. at 19 n.30 (1984)).

97. *United States v. Microsoft*, 1998 WL 614485, at *8 (quoting *Response of Carolina, Inc. v. Leasco Response, Inc.*, 537 F.2d 1307, 1330 (5th Cir. 1976), and citing *Foremost Pro Color, Inc. v. Eastman Kodak Co.*, 703 F.2d 534 (9th Cir. 1983); *Telex Corp. v. IBM*, 367 F. Supp. 258, 347 (N.D. Okla. 1973), *rev’d on other grounds*, 510 F.2d 894 (10th Cir. 1975); *Innovation Data Processing, Inc. v. IBM*, 585 F. Supp. 1470, 1476 (D.N.J. 1984); *ILC Peripherals Leasing Corp. v. IBM*, 448 F. Supp. 228 (N.D. Cal. 1978), *aff’d per curiam sub nom.*, *Memorex Corp. v. IBM*, 636 F.2d 1188 (9th Cir. 1980).

extensive inquiry is conducted under the rule of reason.⁹⁸ To prevail under the rule of reason, the plaintiff must show that the challenged conduct is, on balance, unreasonable.⁹⁹ The plaintiff must first establish that the challenged conduct is prima facie unreasonable by showing a sufficient threat to competition, which the defendant has an opportunity to rebut.¹⁰⁰ The defendant may also respond by presenting a prima facie case of justification, which the plaintiff has an opportunity to rebut.¹⁰¹

Tying arrangements may also be challenged as acts of monopolization or attempted monopolization under section 2 of the Sherman Act.¹⁰² The standard for illegality of tying arrangements under section 2 is the same as for other acts in furtherance of a monopoly or an attempt to monopolize; that is, the arrangement constitutes “exclusionary conduct ‘as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident.’”¹⁰³

B. Monopoly Leveraging Defined

In addition to the tying claim, Parts III and IV will also discuss the related but distinct claim for monopoly leveraging, which made a brief appearance in the *Microsoft* litigation before being dismissed on summary judgment. As originally articulated by the Second Circuit in *Berkey Photo, Inc. v. Eastman Kodak Co.*,¹⁰⁴ monopoly leveraging is “the use of monopoly power attained in one market to gain a competitive advantage in another . . . even if there has not been an attempt to monopolize the second market,” and is subject to challenge under section 2 of the Sherman Act.¹⁰⁵

The Supreme Court has not ruled on the validity of the Second Circuit’s doctrine, but has at least narrowed it by ruling in *Spectrum Sports v. McQuillan*¹⁰⁶ that a single firm’s conduct is unlawful under section 2 “only when it actually monopolizes or dangerously

98. See IX AREEDA, *supra* note 90, ¶ 1728b, at 368-70.

99. See *id.* ¶ 1728c, at 370.

100. See *id.*

101. See *id.*

102. 15 U.S.C. § 2 (2000).

103. *United States v. Microsoft Corp.*, 253 F.3d 34, 58 (D.C. Cir. 2001) (quoting *United States v. Grinnell Corp.*, 384 U.S. 563, 571 (1966)).

104. 603 F.2d 263 (2nd Cir. 1979).

105. *Id.* at 276.

106. 506 U.S. 447 (1993); see also *Verizon Communications, Inc. v. Law Offices of Curtis V. Trinko, L.L.P.*, 540 U.S. 398, 415 n.4 (2004) (affirming requirement of a “‘dangerous probability of success’ in monopolizing a second market”).

threatens to do so.”¹⁰⁷ The Ninth Circuit has categorically rejected leveraging as an independent section 2 offense distinct from monopolization and attempted monopolization.¹⁰⁸ Other lower courts have limited leveraging claims to cases where there is “threatened or actual monopoly in the leveraged market.”¹⁰⁹

In recent years, the Second¹¹⁰ and Federal¹¹¹ Circuits have adopted the Areeda treatise’s approach to narrowing the *Berkey* doctrine. This approach limits leveraging claims to cases where “the [leveraged] market is properly defined” and “the alleged conduct threatens the [leveraged] market with the higher prices or reduced output or quality associated with the kind of monopoly that is ordinarily accompanied by large market share.”¹¹² In such cases, “[t]he gravamen of the offense is not the enlargement of the defendant’s market share at the plaintiffs’ expense or even the destruction of plaintiffs by unfair means. Rather, it must be monopoly market performance measured by reduced output or higher prices in the [leveraged] market.”¹¹³

107. *Spectrum Sports*, 506 U.S. at 459; see also *In re Microsoft Corp. Antitrust Litig.*, 333 F.3d 517, 532 (4th Cir. 2003) (“[M]onopoly leveraging may have been seriously undermined and perhaps been entirely foreclosed by the Supreme Court’s decision in *Spectrum Sports*.”).

108. See, e.g., *Cost Mgmt. Servs., Inc. v. Wash. Natural Gas*, 99 F.3d 937, 952 (9th Cir. 1996) (requiring leveraging plaintiff to “establish each of the elements normally required to prove an attempted monopolization claim”); *Alaska Airlines, Inc. v. United Airlines, Inc.*, 948 F.2d 536, 548 (9th Cir. 1991) (“Unless the monopolist uses its power in the first market to acquire and maintain a monopoly in the second market, or to attempt to do so, there is no Section 2 violation.”).

109. See, e.g., *Hewlett-Packard Co. v. Arch Assocs. Corp.*, 908 F. Supp. 265, 272 (E.D. Pa. 1995) (quoting *Fineman v. Armstrong World Indus.*, 980 F.2d 171, 206 (3rd Cir. 1992)); *Spruce Oil Corp. v. Archer-Daniels-Midland Co.*, 870 F. Supp. 1005, 1007 (D. Colo. 1994); cf. *Aquatherm Indus., Inc. v. Fla. Power & Light Co.*, 145 F.3d 1258, 1262 (11th Cir. 1998) (“*Berkey Photo* [does not extend] to a situation in which a monopolist projects its power into a market it not only does not seek to monopolize, but in which it does not even seek to compete.”).

110. See *Virgin Atl. Airways Ltd. v. British Airways PLC*, 257 F.3d 256, 272 (2nd Cir. 2001) (quoting Areeda); *AD/SAT v. Associated Press*, 181 F.3d 216, 230 (2nd Cir. 1999) (quoting Areeda); see also *Law Offices of Curtis V. Trinko, L.L.P. v. Bell Atl. Corp.*, 305 F.3d 89, 108 (2nd Cir. 2002) (quoting *Virgin Atl.*), cert. granted, 538 U.S. 905 (2003).

111. See *Intergraph Corp. v. Intel Corp.*, 195 F.3d 1346, 1359 (Fed. Cir. 1999) (quoting Areeda).

112. III PHILLIP A. AREEDA ET AL., *ANTITRUST LAW* ¶652c, at 90 (1996).

113. See *Yankees Entm’t & Sports Network, LLC v. Cablevision Sys. Corp.*, 224 F. Supp. 2d 657, 672 (S.D.N.Y. 2002) (quoting Areeda).

C. *The Consent Decree*

In 1990, the FTC's Bureau of Competition began investigating Microsoft's acquisition and maintenance of monopoly power in the worldwide market for PC operating system software products. In July 1993, with one commissioner recusing himself, the commission deadlocked 2-2 on whether to file a complaint against Microsoft and deadlocked again 2-2 on whether to close the case. Soon after reaching this impasse, the Bureau of Competition transferred its voluminous case files to the Antitrust Division.

The Justice Department then commenced its own investigation of Microsoft, an action that, while within the department's powers,¹¹⁴ was recognized as "a rather rare occurrence."¹¹⁵ The department conducted twenty-two depositions and more than one hundred interviews, and reviewed one million pages of documents.¹¹⁶ Meanwhile in Europe, the Directorate General IV of the European Commission had begun an independent investigation of Microsoft's marketing practices. As these investigations progressed, the Justice Department, the Directorate General, and Microsoft eventually negotiated the terms of a settlement. The Directorate General concluded its case with Microsoft on these terms, and the Justice Department and Microsoft moved to settle their case on essentially the same terms. On July 15, 1994, the Justice Department filed suit in the U.S. District Court for the District of Columbia under sections 1 and 2 of the Sherman Act, charging Microsoft with unlawfully maintaining a monopoly and unreasonably restraining trade in the market for IBM-compatible personal computer operating systems. Along with its complaint, the department filed a proposed consent decree embodying the terms of the settlement agreement.

Section 16(e) of the Antitrust Procedures and Penalties Act, known as the Tunney Act, requires the district court to determine whether entry of an antitrust consent decree "is in the public interest."¹¹⁷ Following a public comment period, District Judge Stanley Sporkin conducted a Tunney Act hearing on November 2, 1994, at which he expressed skepticism as to whether the consent decree was a sufficient remedy for Microsoft's alleged anticompetitive practices. Judge Sporkin cited allegations against

114. The Antitrust Division has broad authority to investigate possible antitrust violations under the Antitrust Civil Process Act, 15 U.S.C. § 1311-14.

115. *United States v. Microsoft Corp.*, 56 F.3d 1448, 1451 (D.C. Cir. 1995) (per curiam); see also Ronald S. Katz & Janet Arnold Hart, *Sideshow: U.S. v. Microsoft*, SC71 A.L.I.-A.B.A. COURSE OF STUDY MATERIALS 1 (1998) ("This action was unprecedented in the over 80-year history of the FTC.").

116. *United States v. Microsoft Corp.*, 56 F.3d at 1451.

117. 15 U.S.C. § 16(e).

Microsoft contained in the book *Hard Drive: Bill Gates and the Making of the Microsoft Empire*,¹¹⁸ which he had recently read. Judge Sporkin referred in particular to the allegation that Microsoft had repeatedly engaged in “vaporware” marketing, a practice he defined as “the public announcement of a computer product before it is ready for market for the sole purpose of causing consumers not to purchase a competitor’s product that has been developed and is either currently available for sale or momentarily about to enter the market.”¹¹⁹ For Judge Sporkin, a former Director of the Division of Enforcement at the Securities and Exchange Commission, such “deceitful” efforts to manipulate the market were troubling. Over the parties’ objections, he received further briefings on the proposed consent decree, including exhibits on the vaporware issue, from three anonymous computer industry companies. In a February 14, 1995 decision, Judge Sporkin rejected the decree, concluding that the government had not explained why it had not taken action on Microsoft’s vaporware practices. To approve the settlement, he wrote, would be tantamount to “accepting a probationary plea from a defendant who has told the Court he will go out and again engage in inappropriate conduct.”¹²⁰

Still seeking a prompt settlement on their agreed terms, both the Justice Department and Microsoft appealed. The Court of Appeals responded swiftly by reversing Judge Sporkin’s decision. On June 16, 1995, a three-judge panel found that the district judge had exceeded his authority under the Tunney Act to review antitrust consent decrees by challenging the government’s failure to act on the vaporware issue. The Court of Appeals held that the district court was not permitted to “reach beyond the complaint to evaluate claims that the government did *not* make and to inquire as to why they were not made.”¹²¹ When reviewing the actions of a government agency, the court noted, “‘there must be a strong showing of bad faith or improper behavior’ before the court may ‘inquir[e] into the mental processes of administrative decisionmakers.’”¹²² There had been no suggestion that the Justice

118. JAMES WALLACE & JIM ERICKSON, *HARD DRIVE: BILL GATES AND THE MAKING OF THE MICROSOFT EMPIRE* (1992).

119. *United States v. Microsoft Corp.*, 159 F.R.D. 318, 334 (D.D.C. 1995). For an argument that private plaintiffs may be able to pursue vaporware claims in the wake of the *Microsoft* litigation, see Andrew V. Leventis & Michelle R. Appelrouth, *Are Section 2 Claims More Than Mere Apparitions? The Legal Viability of Vaporware Claims*, *ANTITRUST*, Spring 2001, at 82.

120. *United States v. Microsoft Corp.*, 159 F.R.D. at 336.

121. *United States v. Microsoft Corp.*, 56 F.3d at 1459.

122. *Id.* (quoting *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 420 (1971)). For a criticism of this linking of Tunney Act review to the

Department's investigation had been conducted improperly or in bad faith. Moreover, while a district judge may legitimately inquire into the "purpose, meaning, and efficacy" of a proposed consent decree,¹²³ he is not at liberty to force the government to make new claims or to challenge "practices such as 'vaporware,' that the government does not assert are antitrust violations and which bear no relationship to the practices against which the complaint is directed."¹²⁴ Accordingly, the court remanded the case to the district court with instructions to enter the proposed decree.¹²⁵

The Court of Appeals also granted Microsoft's motion to reassign the case to a different district court judge on remand because it found that Judge Sporkin had demonstrated actual bias in forming an opinion about Microsoft's practices based on his reading of the book *Hard Drive*, which had not been entered into evidence,¹²⁶ and in failing to consider the possible unfairness to Microsoft when he accepted briefs and ex parte submissions from the anonymous companies.¹²⁷ Consequently, the Court of Appeals remanded the case to the district court with instructions to reassign the case, and it was duly transferred to Judge Thomas Penfield Jackson. On August 21, 1995, Judge Jackson entered the consent decree, as the Court of Appeals had directed.¹²⁸

Judge Sporkin had not been alone in his reservations about the settlement. In amicus briefs filed with the Court of Appeals, the anonymous companies had argued that Microsoft could exploit a loophole in the language of section IV(E)(i) of the consent decree, which provided that:

Microsoft shall not enter into any License Agreement in which the terms of that agreement are expressly or impliedly conditioned upon: (i) the licensing of any other Covered Product, Operating System Software product or other product (provided, however, that *this provision in and of itself shall not be construed to prohibit Microsoft from developing integrated*

standard of deference granted to administrative agencies, see Flynn & Bush, *supra* note 11, at 777-81.

A Senate bill to be entitled the "Antitrust Criminal Penalty Enhancement and Reform Act of 2003" has proposed that Tunney Act approval require a judicial finding that "there is reasonable belief, based on substantial evidence and reasoned analysis, to support the United States' conclusion that the consent judgment is in the public interest." S. 1797, 108th Cong. (2003).

123. United States v. Microsoft, 56 F.3d at 1462.

124. *Id.* at 1460.

125. *Id.* at 1462.

126. *Id.* at 1463.

127. *Id.* at 1463-64.

128. United States v. Microsoft Corp., No. CIV.A. 94-1564, 1995 WL 505998 at *1 (D.D.C. Aug. 21, 1995).

products).¹²⁹

The anonymous companies suggested that Microsoft would be able to avoid this prohibition simply by “integrating” the “other product” into a next-generation operating system. The Court of Appeals dismissed this concern by offering some assurance as to how it expected to interpret the provision in the future: “We perceive no interpretation of the decree’s definition of covered products which would allow such a result.”¹³⁰

D. The Contempt Case

The Court of Appeals’s prediction would soon be tested. In August 1996, Microsoft introduced a version of Windows 95 that, according to Microsoft, “integrated” the Internet Explorer Web browser into the Windows 95 operating system within the meaning of the consent decree (hereinafter “Windows 95 with Internet Explorer”). The Justice Department disagreed, and on October 20, 1997, filed suit in the district court alleging that Microsoft should be found in civil contempt of the consent decree. Judge Jackson again took the case.

In a December 11, 1997 opinion,¹³¹ Judge Jackson noted the difficulty of fashioning a working definition of “integrated product” and of applying that definition to Windows 95 with Internet Explorer.¹³² Microsoft had defined an “integrated product” as “a product that ‘combines’ or ‘unites’ functions that, although capable of functioning independently, undoubtedly complement one another,” and concluded that Windows 95 with Internet Explorer constituted such a product.¹³³ Noting that “integrated,” “combined,” and “united” were dictionary synonyms, Judge Jackson found Microsoft’s interpretation plausible and reasonable.¹³⁴ This finding was sufficient to vindicate Microsoft’s conduct on the civil contempt charge, since it precluded a showing that Microsoft had violated a “clear and unambiguous” prohibition in the consent decree.¹³⁵

Since the Justice Department had only filed a contempt petition, Judge Jackson might have dismissed the case after reaching his finding of no contempt. But the government had also

129. *United States v. Microsoft Corp.*, 147 F.3d 935, 939 (D.C. Cir. 1998) (emphasis added).

130. *Id.* at 1462 n.10.

131. *United States v. Microsoft Corp.*, 980 F. Supp. 537 (D.D.C. 1997), *rev’d*, 147 F.3d 935 (D.C. Cir. 1998).

132. *Id.* at 541.

133. *Id.*

134. *Id.*

135. *Id.*

requested a court order clarifying that the consent decree specifically forbade Microsoft from requiring PC manufacturers “to license any version of Internet Explorer as an express or implied condition of licensing Windows 95.”¹³⁶ This request called on the court to formulate a definitive interpretation of the consent decree.¹³⁷

Significantly, Judge Jackson did not adopt Microsoft’s broad definition of “integrated product” as the correct one that should govern the interpretation of the decree.¹³⁸ Instead, noting that section IV(E)(i) was drafted in response to concerns that Microsoft was engaging in illegal “tying” of separate products in violation of the antitrust laws, Judge Jackson concluded that the term “integrated product” should apply only where the antitrust laws would find a single product.¹³⁹

Judge Jackson reserved judgment as to whether Windows 95 with Internet Explorer was, by this narrower definition, an “integrated product,” or alternatively, whether Internet Explorer was an “other product.”¹⁴⁰ He noted that “[d]isputed issues of technological fact, as well as contract interpretation, abound as the record presently stands.”¹⁴¹ In an effort to preserve the status quo while the court conducted further proceedings on these issues,¹⁴² Judge Jackson issued a preliminary injunction prohibiting Microsoft

from the practice of licensing the use of any Microsoft personal computer operating system software (including Windows 95 or any successor version thereof) on the condition, express or implied, that the license [*sic*] also license and preinstall any Microsoft Internet browser software (including Internet Explorer 3.0, 4.0, or any successor versions thereof) pending further order of Court.¹⁴³

Finally, Judge Jackson issued an order referring the case to a special master, then-Harvard Law School professor Lawrence Lessig, “to resolve as expeditiously as possible the complex issues of cybertechnology¹⁴⁴ and contract interpretation” underlying the ultimate question of whether Microsoft had violated the terms of the

136. *United States v. Microsoft Corp.*, 147 F.3d 935, 941-42 (D.C. Cir. 1998).

137. *See id.* at 942.

138. *United States v. Microsoft Corp.*, 980 F. Supp. at 541.

139. *See id.* at 542-43.

140. *See id.* at 543.

141. *Id.*

142. *Id.*

143. *Id.* at 545.

144. “Cybertechnology has come to mean the areas of technology that deal with the Internet and the World Wide Web.” HARRY NEWTON, *NEWTON’S TELECOM DICTIONARY* 217 (19th ed. 2003) (crediting Judge Jackson with coining the term).

consent decree.¹⁴⁵

Microsoft responded to the injunction by informing computer manufacturers who had licensed Windows 95 with Internet Explorer that they were now permitted to delete all of the files that “make up Internet Explorer 3.0 in the retail channel.” Microsoft warned, however, that the resulting version of Windows 95 would not start up and would be “deficient” in other unspecified ways. Microsoft also offered manufacturers the option of installing an obsolete version of Windows 95 that had been released in summer 1995.

The Justice Department argued that Microsoft had deliberately misconstrued the injunction, because these options were so “commercially worthless” as to amount to no choice at all. The department quickly filed another contempt petition, this time seeking a civil penalty of \$1 million a day. During a hearing on January 14, 1998, Judge Jackson challenged Microsoft’s interpretation of the injunction. “It seemed absolutely clear to you that I entered an order that required you to distribute a product that would not work,” he said to Microsoft Vice President David Cole. “That’s what you are telling me?”¹⁴⁶ Judge Jackson did not, however, find Microsoft in violation of the injunction or impose a fine. Instead, the hearing concluded with the parties scheduled to file additional briefings on how Microsoft should comply with the injunction.

A week later, the parties reached an agreement on compliance. Microsoft would offer computer manufacturers two additional options. First, manufacturers would be allowed to remove Internet Explorer using the “Add/Remove” utility in Windows 95. As an alternative, manufacturers would be permitted to delete the Internet Explorer icon from the desktop and from the Programs list in the Start menu, and to mark the executable file IEXPLORE.EXE “hidden.”

This agreement on the interpretation of the preliminary injunction did not conclude the contempt case. For one thing, Judge Jackson had yet to receive and act upon Prof. Lessig’s findings. Also, in the meantime, Microsoft had appealed the issuance of the injunction and the referral to Prof. Lessig.¹⁴⁷ According to Microsoft, Judge Jackson should have simply dismissed the case when he found no contempt in his December 11, 1997 opinion.

Microsoft’s appeal was assigned to a three-judge panel

145. United States v. Microsoft Corp., 980 F. Supp. at 545.

146. Timothy F. Bresnahan, *A Remedy that Falls Short of Restoring Competition*, 16 ANTITRUST 67, 70 (2001) (quoting the transcript of January 14, 1998 hearing in the consent decree case).

147. United States v. Microsoft Corp., 147 F.3d 935, 938 (D.C. Cir. 1998).

consisting of Circuit Judges Patricia Wald,¹⁴⁸ Stephen Williams, and Raymond Randolph, which heard an extended oral argument on April 21, 1998. The Court of Appeals issued two opinions on June 23, 1998: a majority opinion by Judge Williams in which Judge Randolph concurred in full, and a separate opinion by Judge Wald concurring in part and dissenting in part. At the hearing and in their opinions, the judges addressed both the issue of whether Windows 95 with Internet Explorer was an “integrated product” within the meaning of the consent decree and the further question of whether it should be treated as a single product under antitrust law.

The court did not share Microsoft’s view that Judge Jackson was required to dismiss the case once he made his finding of no contempt. Judge Williams wrote: “[E]ven without . . . explicit alternative requests for clarification,” a district court may decide on its own to issue an order clarifying a previous consent decree.¹⁴⁹ The court’s clarification was “altogether reasonable” in this case because the Justice Department’s contempt petition “clearly put[] the meaning of the consent decree in issue” and had asked for “such further orders as the nature of the case may require and as the Court may deem just and proper to compel obedience to and compliance with the orders and decrees of this Court.”¹⁵⁰

Although the Court of Appeals decided that it was proper for Judge Jackson to consider granting an injunction, the court also concluded that he should not have done so in this case. First, the court found that Microsoft had not been given sufficient notice to allow the company a fair opportunity to oppose the injunction.¹⁵¹ Generally, such a finding is sufficient by itself to overturn an injunction.¹⁵² Here, however, the Justice Department had asked the Court of Appeals to let the injunction stand, despite its procedural flaws, pending further proceedings in the district court. Because the Court of Appeals could not consider this request without first evaluating the substantive merits of the injunction, the court took the opportunity to express its views concerning the interpretation of the consent decree.¹⁵³

The Court of Appeals determined that within the meaning of the consent decree, the term “integrated product” means “a product

148. Judge Wald replaced Judge Silberman, who had originally been assigned to the case but recused himself on March 17, 1998.

149. *United States v. Microsoft Corp.*, 147 F.3d 935, 942 (D.C. Cir. 1998).

150. *Id.* (quoting Joint Appendix 43).

151. *Id.* at 943-44.

152. *Id.* at 944 (citing *Williams v. McKeithen*, 939 F.2d 1100, 1105-06 (5th Cir. 1991); *Weitzman v. Stein*, 897 F.2d 653, 657-58 (2nd Cir. 1990); *Phillips v. Chas. Schreiner Bank*, 894 F.2d 127, 130-31 (5th Cir. 1990)).

153. *See id.* at 944-45.

that combines functionalities (which may also be marketed separately and operated together) in a way that offers advantages unavailable if the functionalities are bought separately and combined by the purchaser.”¹⁵⁴ In applying this test, the court stressed that any advantages claimed by the defendant should be deemed sufficient to justify the combination as long as they were “plausible.”¹⁵⁵ Thus, no comparison of advantages and disadvantages should be undertaken, as such an analysis would effectively “put[] judges and juries in the unwelcome position of designing computers.”¹⁵⁶

In applying its own “integrated product” test, the court reasoned that Windows 95’s operating system and graphical user interface “do not exist separately,” because “the code that is required to produce one [set of functionalities] also produces the other.”¹⁵⁷ Similarly, the court determined that versions 3 and 4 of the code accompanying Internet Explorer supported not only Web browsing tasks, but also “some aspects of the operating system unrelated to Web browsing,” and extended the operating system as a platform for Windows applications.¹⁵⁸ On the basis of this sharing of code, the court concluded that the operating system and Web browser functionalities in Windows 95 with Internet Explorer have “no separate existence” and, therefore, could not be obtained separately and combined by a purchaser.¹⁵⁹

In support of Microsoft’s combination of its previously separate operating system and Web browser software products in Windows 95 with Internet Explorer, the court concluded that Microsoft was entitled to claim all of the advantages associated with “the creation of the design that knits the two [functionalities] together,” including all operating system tasks and platform services that share the software code accompanying version 4 of Microsoft’s Internet Explorer software product.¹⁶⁰ Without reaching the question of

154. *Id.* at 948.

155. *Id.* at 950.

156. *Id.* (citing IX AREEDA, *supra* note 90, ¶ 1700j, at 15) (“We emphasize that this analysis does not require a court to find that an integrated product is superior to its stand-alone rivals. . . . The question is not whether the integration is a net plus but merely whether there is a plausible claim that it brings some advantage.”).

157. *Id.* at 949.

158. *Id.* at 951.

159. *Id.* at 951-52 (“[T]he products—the full functionality of the operating system when upgraded by IE 4 and the ‘browser functionality’ of IE 4—do not exist separately. This strikes us as an essential point. If the products have no separate existence, it is incorrect to speak of the purchaser combining them.”).

160. *Id.* at 952.

whether these advantages were “plausible,” the court stated that on the limited preliminary injunction record it was “inclined to conclude” that Windows 95 with Internet Explorer was not merely two products “metaphorically ‘bolt[ed]’” together,¹⁶¹ but a “genuine integration.”¹⁶² The court also described the injunction’s requirement that Microsoft “allow an intermediary to hide the allegedly tied product” as an “oddity” that cast further doubt on the separate existence of operating system and Web browser software products in Windows 95 with Internet Explorer.¹⁶³

The contempt proceedings called for an interpretation of a consent decree, not an application of antitrust tying doctrine. Still, the D.C. Circuit was well aware of the *Microsoft* complaints that had been filed in the district court after the submission of the contempt case to the Court of Appeals,¹⁶⁴ which included a tying claim.¹⁶⁵ In dicta, the Court of Appeals appeared to telegraph its standard of review for that tying claim by stating that its analysis of the meaning and significance of “integration” in the consent decree was “consistent with tying law.”¹⁶⁶ The court thereby indicated, without stating a general rule of antitrust law,¹⁶⁷ that at least for allegedly tied items that represent “an innovation” or a “new product[] integrating functionalities in a useful way,” the separate products inquiry should follow the same line of analysis that was used to determine whether Windows 95 with Internet Explorer was an “integrated product.”¹⁶⁸ Under this approach, the court is to determine whether there are plausible benefits to the combination performed by the defendant that could not have been achieved by a consumer who had obtained the items separately and combined them.¹⁶⁹ If so, then the combination should be considered a single product, thereby negating the first element of the per se illegality standard for tying arrangements. Such a determination need not be

161. *Id.* at 949 (citation omitted); *see also id.* at 955.

162. *Id.* at 952.

163. *Id.* at 952 n.18.

164. *Id.* at 953-54 (acknowledging “the alternative avenues developing in [the government’s] recently launched separate attacks on Microsoft’s practices, Nos. 98-1232 and 98-1233”).

165. *See infra* text accompanying note 184.

166. *United States v. Microsoft Corp.*, 147 F.3d at 950.

167. *See id.* (“Whether or not this is the appropriate test for antitrust law generally, we believe it is the only sensible reading of [the consent decree].”)

168. *Id.*

169. *See id.* at 951 (“The conclusion that integration brings [plausible] benefits does not end the inquiry we have traced out. It is also necessary that there be some reason Microsoft, rather than the OEMs or end users, must bring the functionalities together.” (citing X PHILLIP A. AREEDA ET AL., *ANTITRUST LAW* ¶ 1746b, at 225-29 (1996)).

made, however, if “the code that is required to produce one [set of functionalities] also produces the other,” because in that case the items are deemed to have “no separate existence” and “it is incorrect to speak of the purchaser combining them.”¹⁷⁰

In support of this departure from Supreme Court doctrine on the separate products inquiry,¹⁷¹ the Court of Appeals noted that Prof. Phillip Areeda’s leading antitrust treatise supported the view that “new products integrating functionalities in a useful way should be considered single products regardless of market structure.”¹⁷² The court also cautioned against any interpretation of tying law that would result in “having courts oversee product design” or “any dampening of technological innovation.”¹⁷³ The court did not go on to decide whether Microsoft could be held liable for tying, however, as the question had not been raised in the contempt case.¹⁷⁴

The Court of Appeals recognized that its interpretation of the consent decree was only a tentative one.¹⁷⁵ Since proceedings in the case were continuing before Judge Jackson, a final determination as to whether Microsoft had violated the consent decree would have to await a more complete record.¹⁷⁶ Based on its own analysis, however, the Court of Appeals stated that it was inclined to conclude that Windows 95 with Internet Explorer was a “genuine integration” within the meaning of the consent decree.¹⁷⁷ Because the Justice Department had failed to show a reasonable probability of success

170. *Id.* at 949, 952. One of the authors of the Areeda treatise has criticized the D.C. Circuit’s application of the “plausible benefits” test to the Windows 95/Internet Explorer combination. See Einer Elhauge, *The Court Failed My Test*, WASH. TIMES, July 10, 1998, at A19 (“We know it is feasible to put them on separate disks with independent value because Microsoft in fact did precisely that. And we know that their combination by Microsoft did not confer advantages unobtainable by their combination by buyers because Microsoft actually had its buyers combine the separate disks. Windows 95 / Internet Explorer should thus not have been deemed a single integrated product.”).

171. See *United States v. Microsoft Corp.*, 147 F.3d at 950 (citing *Eastman Kodak Co. v. Image Tech. Servs.*, 504 U.S. 451 (1992)); see also text accompanying note 96 (describing Supreme Court doctrine on the separate products inquiry).

172. *United States v. Microsoft Corp.*, 147 F.3d at 950 (citing X AREEDA, *supra* note 169, ¶ 1746b, at 225-29).

173. *Id.* at 948.

174. See *id.* at 950 n.14 (“The antitrust [tying] question is of course distinct. The parties agree that the consent decree does not bar a challenge under the Sherman Act.”).

175. *Id.* at 953.

176. *Id.* at 952.

177. *Id.*

on the merits of its contempt claim, the Court of Appeals concluded that the district court had erred in granting an injunction against Microsoft.¹⁷⁸

The Court of Appeals also vacated the district court's order referring the case to Prof. Lessig. Although Microsoft had challenged Prof. Lessig's impartiality, the court based the reversal on the broad scope of Prof. Lessig's charge. In the D.C. Circuit, a case may be referred to a special master over a party's objection only for the resolution of "peripheral issues such as discovery and remedy."¹⁷⁹ Because the referral had authorized Prof. Lessig to interpret the consent decree, he would be in the position of determining the parties' rights, not merely interpreting them.¹⁸⁰ The Court of Appeals also questioned the need for a software expert to interpret and apply the consent decree¹⁸¹ and suggested that it would be more appropriate for Judge Jackson to appoint expert witnesses if any "deep technological mysteries" arose during the proceedings.¹⁸²

The Court of Appeals's decision thus turned back the Justice Department's challenge to Microsoft's release of Windows 95 with Internet Explorer and, more importantly, cleared the way for the June 25, 1998 release of Windows 98. Even though the Court of Appeals had not ruled out the possibility that "a more complete record" might ultimately support the Justice Department's position, the agency decided not to renew its challenge to Microsoft's marketing practices as a violation of the 1995 consent decree. Instead, the Justice Department, joined by numerous state attorneys general, would start over with a much broader case against Microsoft, this time based directly on alleged violations of the antitrust laws.

E. The Microsoft Complaints

The new case had already been filed by the time the Court of Appeals effectively disposed of the old one. In separate complaints filed May 18, 1998, the Antitrust Division of the Department of Justice, led by Assistant Attorney General Joel I. Klein, and the attorneys general of twenty states,¹⁸³ led by New York's Dennis C.

178. *Id.* at 953.

179. *Id.* at 956.

180. *Id.* at 954.

181. *Id.* at 954-55.

182. *Id.* at 955 n.22.

183. The twenty original state plaintiffs were New York, California, Connecticut, Florida, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, New Mexico, North Carolina, Ohio, South

Vacco, challenged a wide range of conduct as violations of sections 1 and 2 of the Sherman Act and the corresponding state antitrust statutes.

Five antitrust violations alleged in both the *United States v. Microsoft Corp.* and *New York v. Microsoft Corp.* complaints were essentially the same (allowing for pendent claims based on the various state antitrust statutes), including the claim that Microsoft, through its licensing of Windows 95 and Windows 98, had engaged in illegal tying by requiring PC original equipment manufacturers (“OEMs”) to license and distribute its Internet browser software as a condition of licensing its operating system software.¹⁸⁴ A second claim charged Microsoft with entering exclusive dealing arrangements with Internet access and content providers that substantially foreclosed channels for the distribution of competing Web browser software products.¹⁸⁵ Third, the government charged Microsoft with imposing unreasonably restrictive conditions on the ability of manufacturers to customize the boot sequence and the desktop screen on the computers they sold.¹⁸⁶ Fourth, the government alleged that Microsoft had employed the challenged practices in the illegal maintenance of a monopoly in the market for PC operating systems. Finally, Microsoft was charged with attempting to monopolize the market for Internet browsers.¹⁸⁷ A sixth basis for antitrust liability, alleged by the states but not the Justice Department, was that Microsoft had illegally leveraged its monopoly in the market for PC operating systems to gain market power in the market for Internet browsers.¹⁸⁸ The plaintiffs sought equitable relief.¹⁸⁹

Judge Jackson moved quickly to manage the complexity of the proceedings to come. In a May 22, 1998 scheduling order, he granted Microsoft’s motion to consolidate the federal and state cases.¹⁹⁰ He also combined the hearing on the government’s motion for a preliminary injunction with the main trial, thereby accelerating the trial date but frustrating the government’s efforts

Carolina, Utah, West Virginia, and Wisconsin, and the District of Columbia. See Carol B. Swanson, *Antitrust Excitement in the New Millennium: Microsoft, Mergers, and More*, 54 OKLA. L. REV. 285, 316 n.223 (2001).

184. *United States v. Microsoft Corp.*, No. CIV.A. 98-1232, 1998 WL 614485, at *1-*2 (D.D.C. Sept. 14, 1998).

185. *Id.*

186. *Id.*

187. *Id.*

188. *Id.*

189. *Id.*

190. See United States District Court for District of Columbia Website, at <http://www.dcd.uscourts.gov/98-1232a.pdf> (last visited March 3, 2005).

to block the June release of Windows 98.

In its response, Microsoft denied all of the claims and brought counterclaims against the state plaintiffs alleging that the state-law claims violated Microsoft's rights under, and were preempted by, the federal Copyright Act.¹⁹¹

F. Summary Judgment

Before trial, Microsoft moved for summary judgment on all counts. In an unreported opinion on September 14, 1998,¹⁹² the district court denied Microsoft's motion as to all of the plaintiffs' claims, with the sole exception of the states' monopoly leveraging claim.

The D.C. Circuit had not decided the question of whether monopoly leveraging was an independent section 2 offense separate from monopolization and attempted monopolization. Indeed, the Court of Appeals had expressly reserved this question in its 1984 decision in *AIAW v. NCAA*,¹⁹³ which affirmed Judge Jackson's finding of no liability after his first antitrust trial on the federal bench.¹⁹⁴

Lacking controlling precedent, Judge Jackson based his dismissal of the monopoly leveraging claim on the "single monopoly profit" theory that was introduced in a 1956 article by Aaron Director and Edward Levi¹⁹⁵ and has since been advanced in the law-and-economics scholarship associated with the Chicago School. According to this theory, "[t]here is only one monopoly profit to be made from a chain of production."¹⁹⁶ Thus, a monopolist in one market has nothing to gain from using that monopoly power to obtain a competitive advantage and monopoly profits in a second market, because to do so, it would be necessary to forego those same

191. Defendant Microsoft Corporation's Answer to Plaintiff States' First Amended Complaint and Counterclaim, *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. 1999) (No. 98-1232).

192. *United States v. Microsoft Corp.*, 1998 WL 614485, at *29. The D.C. Circuit affirmed the district court's dismissal of Microsoft's state law claims, describing them as "border[ing] upon the frivolous." *United States v. Microsoft Corp.*, 253 F.3d 34, 63 (D.C. Cir. 2001).

193. *Ass'n for Intercollegiate Athletics for Women v. Nat'l Collegiate Athletic Ass'n*, 735 F.2d 577, 586 n.14 (D.C. Cir. 1984).

194. *Ass'n for Intercollegiate Athletics for Women v. Nat'l Collegiate Athletic Ass'n*, 558 F. Supp. 487, 487 (D.D.C. 1983) (Jackson, J.).

195. See Aaron Director & Edward H. Levi, *Law and the Future: Trade Regulation*, 51 NW. U. L. REV. 281, 290, 292-94 (1956).

196. RICHARD A. POSNER & FRANK H. EASTERBROOK, *ANTITRUST: CASES, ECONOMIC NOTES, AND OTHER MATERIALS* 870 (2d ed. 1981).

monopoly profits in the first market.¹⁹⁷ According to Judge Jackson, the monopoly leveraging claim directly contradicted the single monopoly profit theory:

Assuming that Microsoft has an operating system monopoly and browsers are being sold competitively, Microsoft's incentive is to extract all available monopoly profits from the OS/browser *combination*. Accordingly, it already prices its operating system at the monopoly profit-maximizing price, considering what consumers are willing to pay for the entire package. Even if Microsoft were to obtain a monopoly in the market for browsers, the profit-maximizing price for the combination wouldn't change; Microsoft could not make additional monopoly profits even by monopolizing the browser market as well.¹⁹⁸

As Judge Jackson observed, the "single monopoly profit" theory has been employed as a critique not only of monopoly leveraging claims, but also of tying claims,¹⁹⁹ particularly those alleging that the seller has used a tying arrangement to "enlarge monopoly profits."²⁰⁰ Thus, in making the factual determination that Microsoft's only "incentive" in combining its PC operating system and Web browser software products was "to extract all available monopoly profits,"²⁰¹ Judge Jackson's summary judgment analysis of

197. *See id.*

198. *United States v. Microsoft Corp.*, No. CIV.A. 98-1232, 1998 WL 614485, at *27 (D.D.C. Sept. 14, 1998). George Priest has extended the single monopoly profit theory to account for quality competition in the browser market, arguing that any cost to consumers from being forced to take an inferior tied product would be fully reflected by a reduction in their willingness to pay for the tying product. *See* George L. Priest, *U.S. v. Microsoft: A Case Built on Wild Speculation, Dubious Theories*, WALL ST. J., May 19, 1998, at A22 ("[I]f Netscape Navigator is a better browser than Microsoft Internet Explorer, requiring its inclusion in Windows 98 will reduce Microsoft's competitive advantage over rival operating systems.").

199. *See, e.g.*, ROBERT H. BORK, *THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF* 365 (1978) ("[S]uppression of competition is the one function not accomplished by [tying] arrangements."); RICHARD A. POSNER, *ANTITRUST LAW: AN ECONOMIC PERSPECTIVE* 171 (1976) (arguing that tying is not an exclusionary practice); Ward S. Bowman, Jr., *Tying Arrangements and the Leverage Problem*, 67 *YALE L.J.* 19, 36 (1957).

200. *United States v. Microsoft Corp.*, 1998 WL 614485, at *27 (citing HERBERT HOVENKAMP, *FEDERAL ANTITRUST POLICY* 371 (1994)); *see also* *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 36 (1984) (O'Connor, J., concurring) ("The existence of a tied product normally does not increase the profit that the seller with market power can extract from sales of the *tying* product.").

201. *United States v. Microsoft Corp.*, 1998 WL 614485, at *27. Judge Jackson's conclusions of law would squarely contradict this factual

the monopoly leveraging claim also appeared to cast doubt on the viability of the tying claim.

Despite this, the court denied Microsoft's motion for summary judgment on the tying claim. Making no mention of the "single monopoly profit" theory, the court's analysis of the tying claim instead centered on Microsoft's contention that as a "physically integrated" product, Windows 98's operating system and Web browser functionalities should be considered a single product.

Beginning with its motion for summary judgment and throughout the *Microsoft* litigation, Microsoft avoided referring to its Internet Explorer Web browser as an independent entity, and instead used the phrase "Internet Explorer technologies" to refer to the software accompanying Windows 98 that is executed when the Internet Explorer Web browser is used.²⁰² Since Microsoft had designed Windows 98 so that there was no apparent means for removing the "Internet Explorer technologies" without crippling Windows 98's functionalities, Microsoft contended that Windows 98 was "integrated."²⁰³

Microsoft argued that the technological tying cases, rather than *Jefferson Parish*, controlled the separate products inquiry because the combination of operating system and Web browser functionalities in Windows 98 constituted a physically integrated product and involved questions of product design.²⁰⁴ Judge Jackson disagreed with Microsoft's position, stating that he had "misgivings" about departing from the Supreme Court's approach in *Jefferson Parish*²⁰⁵ and pointing out that, unlike the plaintiffs in the technological tying cases, here the government was challenging Microsoft's refusal to offer its operating system and Web browser software products separately, not Microsoft's right to combine those products.²⁰⁶

Despite his reservations, however, Judge Jackson regarded and

determination and, therefore, call into doubt his summary dismissal of the monopoly leveraging claim. *See infra* note 329.

202. *See* Defendant Microsoft Corporation's Memorandum in Support of its Motion for Summary Judgment at 3-4, No. CIV.A. 98-1233, 1998 WL 614485 (D.D.C. 1998) (describing the inclusion of "Internet Explorer technologies" in Windows 95 and Windows 98).

203. *See id.* at 3-5 (arguing that "Internet Explorer Technologies Are an Integrated Element of Windows 98 That Cannot Be Removed Without Severely Degrading the Operating System").

204. *See* *United States v. Microsoft Corp.*, No. CIV.A. 98-1233, 1998 WL 614485, at *7-*8 (D.D.C. Sept. 14, 1998).

205. *See id.* at *10.

206. *See id.* at *9.

treated the D.C. Circuit's dicta in the contempt case²⁰⁷ as the controlling law of the *Microsoft* case with respect to the separate products issue,²⁰⁸ rather than *Jefferson Parish*, even though he was under no obligation to do so (as he would later observe).²⁰⁹ Applying the Court of Appeals's "facially plausible benefits" standard to the summary judgment record, the district court concluded that there remained genuine issues of material fact regarding whether there were "synergistic" benefits that were unique to the particular way Microsoft combined an operating system with a browser in Windows 98, whether there were benefits to the "integration" performed by Microsoft when compared with a combination performed by a consumer, and whether Microsoft had "bolted" two products together "for an anticompetitive purpose (or for no purpose at all)."²¹⁰ Therefore, a triable question remained as to whether the tying claim involved two separate products.

As to whether Microsoft had conditioned the sale of its operating system software product on the purchase of its Web browser software product, Microsoft argued that no such condition could be found, since all of the software accompanying Windows 98 was licensed for a single royalty payment.²¹¹ Arguably, Microsoft was giving away Internet Explorer for free. Judge Jackson, however, stated that the relevant question was not how Microsoft priced its software products but whether Microsoft compelled its licensees "to take (and, one way or the other, to pay for) the entire package of software."²¹² At trial, therefore, the government would have to prove that "licensees 'might have preferred' not to license a browser, or to license it 'elsewhere on different terms' . . . and that Microsoft 'coerces the abdication of [licensees'] independent judgment' as to the relative merits of competing browsers."²¹³

207. See *supra* text accompanying note 166.

208. *United States v. Microsoft Corp.*, 1998 WL 614485, at *10 ("[T]he D.C. Circuit clearly appears to have adopted Microsoft's proposed 'technological tying' standard [in the contempt case].").

209. See *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30, 47 (D.D.C. 2000), *aff'd in part, rev'd in part on other grounds*, 253 F.3d 34 (D.C. Cir. 2001) ("The court of appeals' observations on the extent to which software product design decisions may be subject to judicial scrutiny in the course of § 1 tying cases are in the strictest sense *obiter dicta*, and are thus not formally binding.").

210. See *United States v. Microsoft Corp.*, 1998 WL 614485, at *3, *12 (quoting *United States v. Microsoft Corp.*, 147 F.3d 935, 949, n.12 (D.C. Cir. 1998)).

211. *Id.* at *12.

212. *Id.*

213. *Id.* (quoting *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 12 (1984); *Times-Picayune Publ'g Co. v. United States*, 345 U.S. 594, 605 (1953)) (alteration in original).

Microsoft did not specifically contest the market power element of the tying claim in its summary judgment motion. Regarding the final element, significant foreclosure in the tied product market, Microsoft argued that there were no appreciable technological or contractual impediments to the distribution of competing Web browser software products, such as Netscape Navigator.²¹⁴ The government, however, presented evidence that OEMs, having already installed Windows 98 with Internet Explorer, had faced economic disincentives to installing additional, competing Web browser software products on the systems they sold.²¹⁵ The court found this evidence sufficient to raise a genuine issue of material fact as to whether Microsoft had foreclosed a substantial volume of commerce in the allegedly tied product market.²¹⁶ Because Microsoft had failed to demonstrate the absence of a genuine issue of material fact with respect to any element of the tying claim, the court denied Microsoft's motion for summary judgment.²¹⁷

G. Trial

During a seventy-eight-day bench trial that began on October 19, 1998 and ended on June 24, 1999, the government and Microsoft advanced widely divergent conceptions of the tying claim.

1. The Government's Theory

According to the government, Microsoft's tying arrangement was part of a larger campaign by Microsoft to impede the distribution, installation and use of platform software on PCs that threatened Microsoft's monopoly in the market for Intel-compatible²¹⁸ PC operating system software products. The government argued that Microsoft's operating system monopoly was protected by a strong consumer preference for the vast number and variety of popular application software products that require the pre-installation of Windows platform software as a precondition to use.²¹⁹ In effect, competing platform software vendors face an

214. *See id.* at *13.

215. *See id.*

216. *See id.*

217. *See id.* at *29.

218. "An Intel-compatible PC is one designed to function with Intel's 80x86/Pentium families of microprocessors or with compatible microprocessors manufactured by Intel or by other firms." *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 12-13, ¶ 3 (D.D.C. 1999).

219. *See generally* Pls.' Joint Proposed Findings of Fact ¶¶ 25-32, *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30 (D.D.C. 2000) (No. 98-1232) [hereinafter *Government's Proposed Findings of Fact*] (describing applications barrier to entry).

“applications barrier to entry” resulting from the general tendency of application software developers to direct their efforts toward the most widely installed platforms.²²⁰

The government contended that the emergence of the World Wide Web led Microsoft to regard products containing platform software for Web browser-based applications as a nascent threat to Windows’s applications barrier to entry. In 1995, Netscape Communications Corp.’s Navigator (which included a Web browser software product) and Sun Microsystems, Inc.’s Java Virtual Machine (“JVM,” an interpreter for the Java programming language, which was distributed with Navigator) were the most popular software products of this kind, with retail versions available for Windows as well as several other operating systems. With the growing popularity of the Web, Microsoft feared that the platform software—more specifically, middleware—accompanying these software products would eventually be so widely installed as to compete effectively with the Windows platform for the efforts of application software developers, thereby eroding the applications barrier to entry. To forestall this middleware threat, Microsoft undertook an anticompetitive course of conduct to impede the distribution, installation, and use of Navigator and Sun’s JVM including, *inter alia*, conditioning the sale of its Windows operating system software product on the purchase of its Internet Explorer Web browser software product.²²¹

The government also argued that conditioning the sale of Microsoft’s monopoly product, Windows, on the purchase of Internet Explorer also had the practical effect of foreclosing Microsoft’s competitors from distributing and licensing Navigator and other Web browser software products to consumers. According to the government, Microsoft’s tying condition ensured that OEMs who chose to install a second Web browser software product would face increased technical support, testing, and opportunity costs,²²² and users who chose to do so would experience increased confusion and technical support costs and a degradation in system performance.²²³

220. *See id.* ¶¶ 24-25.

221. The distinction between a software product and its accompanying software is, of course, a fundamental one. *See supra* text accompanying notes 15-27. To preserve it, I will employ the somewhat unwieldy terminology “software that accompanies a software product” throughout this Article. As a side benefit, however, the distinction also permits me to discuss the “sale” or “purchase” of a software product without implying that the accompanying software is sold or purchased.

222. *See* Government’s Proposed Findings of Fact, *supra* note 219, ¶¶ 167-68.

223. *See id.* ¶¶ 170-71.

By deterring consumers from installing and using Web browser software products other than Internet Explorer, Microsoft harmed competition in the market for Web browser software products. Thus, according to the government, the same conduct constituted both illegal monopoly maintenance under section 2 of the Sherman Act and an illegal tying arrangement under section 1 of the Sherman Act.²²⁴

According to the government, Microsoft initially implemented the challenged tying condition using contractual means. Beginning in 1995, Microsoft entered into various license agreements with OEMs expressly requiring them to install Internet Explorer on all PCs on which Windows 95 was installed and prohibiting them from modifying or deleting any part of the installed software.²²⁵ Subsequently, however, Microsoft turned to technological methods of tying Internet Explorer to Windows. In June 1998, Microsoft began distributing a single set of code under the name Windows 98 that both included the latest version of the Windows operating system and supported the functionalities of Internet Explorer. Three aspects of Windows 98's design made it difficult, as a technological matter, for a consumer to purchase, install, and use Microsoft's Intel-compatible operating system software product without also purchasing, installing, and using Microsoft's Web browser software product. First, Microsoft eliminated the facility that had been provided in Windows 95 for using the "Add/Remove Programs" utility to uninstall Internet Explorer automatically.²²⁶ Second, Microsoft placed "browsing-specific" code (that is, code that the system needs to execute only for the purpose of supporting Web browsing) into the same Windows 98 library files as operating system routines, thereby eliminating the ability of OEMs and users to uninstall Internet Explorer manually by identifying and deleting software files associated with the product.²²⁷ Finally, Microsoft "hard-coded" Windows 98 to require the use of Internet Explorer in some circumstances where the user had selected as his or her default choice and expected to use a different software product for the purpose of Web browsing.²²⁸

Even though Windows 98's licenses did not expressly require the installation of Internet Explorer, the government contended that

224. *See supra* text accompanying note 102.

225. *See* Government's Proposed Findings of Fact, *supra* note 219, ¶ 127.

226. *See id.* ¶ 147.3.

227. *See* Testimony of Edward W. Felten ¶ 58, *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30 (D.D.C. 2000) (No. 98-1232) [hereinafter *Felten Direct Testimony*].

228. *See id.* ¶ 51.

the existence of such a condition had been reasonably understood by Microsoft's licensees. According to the government, Microsoft had tied its operating system and Web browser software products in Windows 98 through technological rather than contractual means. In the absence of an express contractual provision, the government sought to demonstrate the existence of an understood tying condition by showing that Microsoft rebuffed requests for a separate provision²²⁹ and that customers reasonably believed that such requests would be futile or excessively burdensome.²³⁰

The government addressed the *Jefferson Parish* separate products inquiry by presenting evidence that there was "sufficient consumer demand so that it was efficient for a firm to provide [browser and operating system software products] separately." As the government's witnesses explained, corporate information managers prefer to make separate choices of operating system and Web browser software products for their organizations, so that employees using different operating systems can standardize on the same browser.²³¹ Consumers also tend to make decisions about

229. See Government's Proposed Findings of Fact, *supra* note 219, ¶ 143.1 (describing a letter from Microsoft denying Gateway's request for a version of Windows 98 from which Internet Explorer had been uninstalled); see also *id.* ¶ 128.1 (describing Microsoft's threat to terminate Compaq's Windows license unless Compaq restored the Internet Explorer icons to the Windows 95 desktop). See generally *id.* ¶ 177 (describing Microsoft's responses to OEM modifications to Windows 98 that "threatened Microsoft's objective of gaining browser usage share"). Courts have held such refusals to be probative of coercion. See, e.g., *Capital Temporaries Inc. of Hartford v. Olsten Corp.*, 506 F.2d 658, 666 (2nd Cir. 1974) (finding no tying condition where there was no evidence that the buyer objected to the purchase of the combination); *McCullough Tool Co. v. Well Surveys, Inc.*, 343 F.2d 381, 408 (10th Cir. 1965) (stating that "an element of coercion" in the package licensing of patents exists "where there has been a request by a prospective licensee for a license under less than all of the patents and a refusal by the licensor to grant such a license").

230. See Government's Proposed Findings of Fact, *supra* note 219, ¶ 177.3.2 (stating that OEMs, including Hewlett-Packard, acquiesced in the requirement to feature Internet Explorer because they had no practical alternative); see also *id.* ¶ 127 (stating that Compaq recognized that it was required to include Internet Explorer with the PCs it shipped). Coercion can be inferred from circumstances indicating that customers reasonably believed that requests for separate provision would be futile or excessively burdensome. See *X AREEDA*, *supra* note 169, ¶ 1756e, at 325; see also *Tic-X-Press, Inc. v. Omni Promotions Co. of Ga.*, 815 F.2d 1407, 1418-19 (11th Cir. 1987) (finding coercion where purchasers did not request separate provision because "they understood from years of dealing with the [seller]" that they were required to purchase the tied product).

231. See Government's Proposed Findings of Fact, *supra* note 219, ¶¶ 104-08.

which Web browser software product to use, including when to upgrade to a new version, independently of their decisions about which operating system software product to use.²³² Furthermore, some consumers who demand operating system software products do not want a Web browser software product at all.²³³ According to the government, every vendor other than Microsoft responded to this separate demand by allowing consumers to install and use its operating system software product without also installing or using its Web browser software product.²³⁴

The government also addressed the “plausible benefits” standard that Judge Jackson had used in his summary judgment opinion. The government argued that Windows 98 was a bundle of two separate software products—an operating system software product and a Web browser software product—that had been technologically “bolted” together with no resulting benefit to the user. The government did not explicitly define either of these software products by identifying the legal rights or technological attributes that constituted each product, even though, as the plaintiff, it was entitled to identify the tying and tied products that serve as the predicates for the alleged offense.²³⁵ Instead, the government identified specific functions that are characteristically supported by operating system²³⁶ and Web browser²³⁷ software, respectively.

The government then presented testimonial and demonstrative evidence intended to show that there was no justification for Microsoft’s technological implementation of the challenged tying condition in Windows 98. Edward Felten, a computer science professor at Princeton University, developed a prototype computer

232. *See id.* ¶¶ 109-10.

233. *See id.* ¶ 111.

234. *See id.* ¶¶ 114-16; *see also id.* ¶¶ 117-18 (noting that Microsoft allowed end users to uninstall Internet Explorer before the release of Windows 98).

235. *See, e.g.,* X AREEDA, *supra* note 169, ¶ 1732, at 8 (“If more than one plausible tying product appears, the plaintiff designates the one that allegedly forces customers to accept an unwanted second product from the defendant. . . . Of course, the plaintiff must then prove that the alleged tying and tied items [satisfy each of the other elements of an illegal tying arrangement].”).

236. *See* Government’s Proposed Findings of Fact, *supra* note 219, ¶ 8 (stating that an operating system “controls the allocation and usage of hardware resources such as memory, central processing unit time, disk space, and peripheral devices,” and “provides a ‘platform’ by exposing [programming interfaces] that applications use to ‘call upon’ the operating system’s underlying software routines”).

237. *See id.* ¶ 13 (defining a browser as a “client application that enables a user to view HTML documents on the World Wide Web, another network, or the users’s [sic] computer; follow the hyperlinks among them; and transfer files”).

program that purported to remove Internet Explorer from Windows 98 in that “[i]t remove[d] the ability to browse the Web, and it prepare[d] the machine to accept the installation of another web browser.”²³⁸ In his direct testimony, Prof. Felten provided a list of documented methods of launching Internet Explorer in Windows 98.²³⁹ Prof. Felten presented a courtroom demonstration to show that after his program was run on a PC on which Windows 98 had been installed, Internet Explorer could not be launched using any of the listed methods²⁴⁰ but Windows 98’s platform software and other features remained intact.²⁴¹ Prof. Felten described this as removing “Microsoft’s browser product.”²⁴² According to Prof. Felten, this allows a user the freedom to install and use the Web browser software products of their choice (including Internet Explorer, if they prefer it) so that “the user’s choice of Default Browser [will] be respected in all cases.”²⁴³ Thus, he concluded, “[i]f the user chooses Navigator, this will provide the user with the full Web browsing experience offered by Navigator.”²⁴⁴ Also, after Prof. Felten’s program has been run, running Windows 98 occupies approximately twenty percent less space in RAM than before.

Based on Prof. Felten’s testimony, the government argued that Microsoft, without any degradation in software performance, easily could have distributed its software so as to give consumers the option of installing and using Windows 98 either with or without the functions that are characteristically supported by Web browser software—that is, with or without “the ability to browse the [W]eb.”²⁴⁵ By illustrating the removal of Internet Explorer in this way, the government sought to define the separate Web browser software product in Windows 98 implicitly, by describing what it does—the product confers upon a user the ability to browse the Web—rather than what it is. Since Microsoft could easily have offered consumers the operating system software product in

238. *See id.* ¶ 153 (citing testimony of Edward Felten at 46:14-48:2, United States v. Microsoft Corp., 87 F. Supp. 2d 30 (D.D.C. 2000) (No. 98-1232)).

239. Felten Direct Testimony, *supra* note 227, at App. A.

240. *See* Government’s Proposed Findings of Fact, *supra* note 219, ¶ 54.

241. *Id.* ¶¶ 55-57.

242. Tr. June 10, 1999 P.M. at *17, United States v. Microsoft Corp., 84 F. Supp. 2d 9 (D.D.C. 1999) (No. CIV A 98-1232(TPJ) (cross-examination of Edward W. Felten), *available at* 1999 WL 380891.

243. Felten Direct Testimony, *supra* note 227, ¶ 70.

244. *Id.*

245. *See* Government’s Proposed Findings of Fact, *supra* note 219, ¶ 153 (“As Professor [Edward] Felten demonstrated, Microsoft could easily supply a version of Windows 98, without the ability to browse the web, to which users could add the browser of their choice.”).

Windows 98 without the challenged tying condition, with the full version of Windows 98 available for those who wanted it, there were no benefits attributable to Microsoft's technological implementation of the tying condition in Windows 98.

2. *Microsoft's Theory*

From Microsoft's perspective, the D.C. Circuit's opinion in the contempt case came very close to immunizing Windows 98 from tying liability. Like Windows 95 with Internet Explorer, Windows 98 featured an "interpenetrating design" in which the same code supported both Web browsing and operating system tasks, and also served as platform software for Windows applications. In accordance with the D.C. Circuit's reasoning,²⁴⁶ Microsoft argued that Internet Explorer, alleged to be the tied software product, had no separate existence in Windows 98 but was "logically and naturally part of Windows."²⁴⁷

Microsoft discounted the government's efforts to define a separate Web browser software product in Windows 98 implicitly.²⁴⁸ According to Microsoft, "software products consist of software code and nothing else."²⁴⁹ To proceed with its tying claim, the government was therefore obligated to define the tied software product in explicit terms—that is, by identifying the lines of code that constituted Internet Explorer.²⁵⁰ Microsoft described the government's refusal to do so as an "inability to identify the allegedly tied product."²⁵¹

According to Microsoft, Prof. Felten's program did not remove Internet Explorer from Windows 98 but "merely cover[ed] up" or "hid[] most access to Web browsing functionality in Windows 98."²⁵² In support of this contention, Microsoft noted that Prof. Felten's program did not attempt to remove all of the Internet Explorer technologies from Windows 98²⁵³ but instead deleted only a relatively small amount of software code.²⁵⁴ Microsoft also demonstrated in court that even after Prof. Felten's program had been run, it was possible to launch Internet Explorer using an undocumented method that was not on Prof. Felten's list.²⁵⁵

246. *See supra* notes 157-59 and accompanying text.

247. Microsoft's Proposed Findings of Fact, *supra* note 17, ¶ 539.

248. *See supra* text accompanying notes 235-45.

249. Microsoft's Proposed Findings of Fact, *supra* note 17, ¶ 569.

250. *See id.* ¶¶ 566-71.

251. *Id.*

252. *Id.* ¶ 571.

253. *Id.* ¶ 588.

254. *Id.* ¶¶ 577-78.

255. *See id.* ¶ 586.

Microsoft did not offer its own definition of Internet Explorer but identified certain “core Internet Explorer [software] files that provide Web browsing functionality in Windows 98.”²⁵⁶ Microsoft used the term “Internet Explorer technologies” to refer to some or all of the “software code in Windows 98 that provides Web browsing functionality”²⁵⁷ and pointed out that this code also supports various operating system features and platform services in Windows 98.²⁵⁸ Microsoft described this sharing of software code as Windows 98’s “integrated design”²⁵⁹ and characterized the government’s tying claim as a “direct challenge to the [integrated] design of Windows 98.”²⁶⁰ Thus, under the “plausible benefits” standard, the burden was on the government “to demonstrate the absence of facially plausible benefits resulting from Microsoft’s integration of Internet Explorer into Windows.”²⁶¹ According to Microsoft, however, Windows 98’s integrated design resulted in many benefits, including

256. Direct Testimony of James Allchin ¶ 162, *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30 (D.D.C. 2000) (No. 98-1232) [hereinafter Allchin Direct Testimony].

257. Microsoft’s Senior Vice President James Allchin introduced the term in his direct testimony:

The very same software code in Windows 98 that provides Web browsing functionality *also* provides (i) platform support to developers, (ii) user interface software (for Windows itself and other software products) and (iii) access to information stored in locations other than the Internet. That software code is called Internet Explorer, and it is so central to the operation of Windows 98 that the operating system would fail to function if it were removed. . . . In short, the design of Windows 98—and many of the benefits that flow from it—depends upon Internet Explorer technologies being part of the operating system.

Allchin Direct Testimony, *supra* note 256, ¶ 9-10; *see also id.* ¶ 29 (“The Internet-related technologies in Windows are comprised of many elements, including the following: (i) software code that provides support for Internet protocols like TCP/IP and HTTP; (ii) software code for connecting a computer to an Internet service provider; (iii) software code for accessing and viewing information on the Internet; (iv) software code that provides services like HTML display to other parts of the operating system, as well as a platform for software developers writing Internet-aware applications and content developers creating Web sites. Depending on the context, it is common for people at Microsoft to use the term “Internet Explorer” to refer to any one of these technologies or a group of them in combination.”); *id.* at Appendix A (listing Windows 98 features supported by Internet Explorer technologies).

258. *See id.* at App. A (listing features).

259. *See id.* ¶¶ 76-104.

260. *See* Defendant Microsoft Corporation’s Proposed Conclusions of Law, 2000 WL 150760, at *2, *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. 1999) (No. 98-1232, No. 98-1233) [hereinafter Microsoft’s Proposed Conclusions of Law].

261. Microsoft’s Proposed Findings of Fact, *supra* note 17, ¶ 525.

all of the operating system features²⁶² and platform services²⁶³ that were supported by Internet Explorer technologies. Microsoft also argued that the installation of Internet Explorer technologies with every copy of Windows 98 would allow consumers to enjoy greater “compatibility among software products”²⁶⁴ and a “‘best-of-breed’ implementation . . . of [Web browsing] functionality.”²⁶⁵ Having identified these “facially plausible benefits to its integrated design,”²⁶⁶ Microsoft argued that Windows 98 should be considered a single product for purposes of tying analysis.²⁶⁷

Microsoft singled out one feature supported by Internet Explorer technologies, “seamless navigation” between local and remotely stored information, as having directly “provide[d] usability benefits” to Windows 98 users.²⁶⁸ According to Microsoft, “it is desirable to design software products so that customers can find and view information without requiring them to use different programs and learn different user interfaces depending on where desired information is located.”²⁶⁹ More generally, “[e]fforts to make information access more seamless and consistent has been a steady theme in the development of the computer industry.”²⁷⁰ In Microsoft’s view, it was counterproductive for the government to “[t]ry[] to establish artificial boundaries between . . . software components” such as an operating system and a browser, because “[p]reordained limits on functions performed by . . . software components would impede design choices, with unforeseeable adverse consequences for consumers.”²⁷¹

Microsoft also addressed the other elements of the tying offense.

262. See *id.* ¶ 546 (citing Allchin Direct Testimony, *supra* note 256, at App. A) (“[Plaintiffs] have no response to the long list of features and functions contained in Appendix A to Allchin’s testimony, all of which depend on the presence of Internet Explorer [technologies] in the operating system.”).

263. See Allchin Direct Testimony, *supra* note 256, ¶¶ 124-37 (describing advantages to software developers from the inclusion of Internet Explorer technologies in Windows 98 platform software).

264. See Microsoft’s Proposed Findings of Fact, *supra* note 17, ¶ 556.

265. See *id.* ¶ 555.

266. *United States v. Microsoft Corp.*, 147 F.3d 935, 950 (D.C. Cir. 1998).

267. Microsoft’s Proposed Conclusions of Law, *supra* note 260, at *3-*12 (arguing that Windows 98 is a “single, integrated product”).

268. Microsoft’s Proposed Findings of Fact, *supra* note 17, ¶ 545; see also Allchin Direct Testimony, *supra* note 256, at app. A, ¶ (i) (“[C]ustomers can seamlessly navigate between folders and files stored on their personal computer, on a local area network, on a wide area network or on Web sites around the world.”).

269. Allchin Direct Testimony, *supra* note 256, ¶ 68.

270. *Id.* ¶ 70.

271. *Id.* ¶ 3.

In connection with the government's monopoly maintenance claim, Microsoft argued that the product market for Intel-compatible PC operating system software products had been drawn much too narrowly²⁷² and disputed the existence of an applications barrier to entry.²⁷³ A showing that Windows was not a monopoly product would tend to negate the market power element of the tying claim.²⁷⁴

Regarding the conditioning element of the tying claim, Microsoft repeated its summary judgment argument that no tying condition could be found "[w]here a defendant gives the allegedly tied product away for free."²⁷⁵

Microsoft argued that no foreclosure could have resulted from the alleged tie, since Microsoft had never prohibited OEMs or users from obtaining, installing, or using competing Web browser software products on their PCs.²⁷⁶ In addressing the government's attempted monopolization claim, Microsoft further contended that there was no market to foreclose since "the competitive price of Web browsing software is zero."²⁷⁷ Moreover, Microsoft argued that there were "no structural barriers to entry into the development and marketing of Web browsing software."²⁷⁸

Finally, Microsoft argued that the states' antitrust claims were preempted by federal copyright law to the extent that they sought to encroach on Microsoft's rights as a copyright owner. According to Microsoft, the state-law tying claims sought to impair "Microsoft's right to license its copyrighted software in an unaltered form" and thereby conflicted with Microsoft's exclusive right under section 106 of the Copyright Act "to publish, copy, and distribute the author's work."²⁷⁹

272. See Microsoft's Proposed Findings of Fact, *supra* note 17, ¶¶ 187-235.

273. See *id.* ¶¶ 257-311.

274. See *Antitrust Analysis*, *supra* note 28, at 2 & n.1.

275. Microsoft's Proposed Conclusions of Law, *supra* note 260, at *12-*13.

276. *Id.* at *14-*15.

277. Microsoft's Proposed Findings of Fact, *supra* note 17, ¶¶ 369-75.

278. Microsoft's Proposed Conclusions of Law, *supra* note 260, at *25. Some courts have held that even a defendant with a high market share does not have a dangerous probability of monopolizing a market that lacks structural barriers to entry. See, e.g., *Dial A Car, Inc. v. Transportation, Inc.*, 82 F.3d 484, 486-88 (D.C. Cir. 1996); *Barr Labs., Inc. v. Abbott Labs.*, 978 F.2d 98, 112-114 (3d Cir. 1992); *Bacchus Indus., Inc. v. Arvin Indus., Inc.*, 939 F.2d 887, 894-95 (10th Cir. 1991).

279. Defendant Microsoft Corporation's Memorandum in Opposition to the States' Memorandum and Proposed Conclusions of Law at 9, *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. 1999) (No. 98-1232, No. 98-1233) (quoting *Harper & Row, Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 546-47 (1985)).

H. Findings of Fact

In findings of fact issued on November 5, 1999, Judge Jackson accepted the government's proof regarding Microsoft's conduct in implementing the challenged tie.²⁸⁰ He also accepted the government's implicit approach to defining a Web browser software product based on what it does; namely, it "provides the ability for the end user to select, retrieve, and perceive resources on the Web."²⁸¹ With this understanding of the alleged tied product, the court made findings apparently addressed to both the *Jefferson Parish* and "plausible benefits" standards for the separate products inquiry. Specifically, the court found that "[b]ecause of the separate demand for browsers and operating systems, firms have found it efficient to supply the products separately"²⁸² and that this demand by consumers and supply response by vendors "creates a market for Web browsing functionality."²⁸³ Based on Prof. Felten's demonstration and testimony, the court also determined that "Microsoft could offer consumers all the benefits of the current Windows 98 package by distributing the [operating system and Web browser software] products separately and allowing OEMs or consumers themselves to combine the products if they wished."²⁸⁴ Accordingly, the court concluded that "[n]o consumer benefit can be ascribed . . . to Microsoft's refusal to offer a version of Windows 95 or Windows 98 without Internet Explorer or to Microsoft's refusal to provide a method for uninstalling Internet Explorer from Windows 98."²⁸⁵

Regarding the existence of a tying condition, the court agreed with the government that Microsoft had rebuffed "specific requests from [an OEM] that Microsoft provide a way to uninstall Internet Explorer 4.0 from Windows 98"²⁸⁶ and that OEMs "obeyed" license requirements that all of the documented methods for launching Internet Explorer be preserved because "they perceived no alternative to licensing Windows for pre-installation on their PCs."²⁸⁷ The court also found that Microsoft had monopoly power in the market for the alleged tying product—Intel-compatible PC operating

280. *See supra* text accompanying notes 225-28.

281. *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 48, ¶ 150 (D.D.C. 1999).

282. *Id.* at 48, ¶ 153.

283. *Id.* at 58, ¶ 201.

284. *Id.* at 56, ¶ 191.

285. *Id.* at 55, ¶ 186.

286. *Id.* at 52, ¶ 170.

287. *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 62, ¶ 215.

system software products²⁸⁸—and that forcing OEMs to pre-install Internet Explorer with Windows had the purpose and effect of excluding Netscape and other Web browser software vendors from “the distribution channels that lead most efficiently to browser usage”²⁸⁹ and “deter[ring] Netscape from undertaking technical innovations that it might otherwise have implemented in Navigator.”²⁹⁰ Taken together, these findings appeared to address each of the required elements for per se tying liability.

Judge Jackson also made significant findings regarding the nature of Web browser software products. He observed that “consumers generally choose which software products to license, install, and use on the basis of the products’ functionalities, not their designs and implementations.”²⁹¹ Accordingly, Judge Jackson defined a “Web browser” only in terms of the “functionalities . . . [it] offers a user”²⁹² and the principal user task it supports, namely “[t]he use of Web browsers to conduct Web transactions.”²⁹³ Employing implementation-independent language, Judge Jackson specified three intentions of a user who uses a Web browser to conduct a Web transaction: “to select, retrieve, and perceive resources on the Web.”²⁹⁴

In crediting Prof. Felten’s testimony, the court specifically rejected any characterization of the Internet Explorer software product that equated the product with either its accompanying code or the installation of its accompanying code as platform software. Judge Jackson found that “the functionalities of a software product are not provided by the mere presence of code on a computer’s hard drive. For software code to provide any functionalities at all, the code must be loaded into the computer’s dynamic memory and executed.”²⁹⁵ Thus, he concluded that Prof. Felten’s program succeeded in removing the Internet Explorer software product when

288. *See id.* at 19, ¶ 33.

289. *Id.* at 46-48, ¶¶ 143-48 (finding that Microsoft bundled Internet Explorer with Windows for the purpose of “constrict[ing] Netscape’s access to the distribution channels that lead most efficiently to browser usage”); *id.* at 49, ¶ 159 (finding that “the inability to remove Internet Explorer made OEMs less disposed to pre-install Navigator onto Windows 95”); *id.* at 98, ¶ 357 (finding that Microsoft succeeded in this purpose).

290. *Id.* at 103, ¶ 379.

291. *Id.* at 48, ¶ 149.

292. *Id.* at 48, ¶ 150.

293. *Id.* at 58, ¶ 201.

294. *Id.* at 48, ¶ 150; *see also id.* at 14, ¶ 16 (providing the same definition, but noting that in typical implementations of Web browsers, a user follows a hyperlink “by moving the cursor over a link and depressing the mouse button”).

295. *Id.* at 55, ¶ 184.

it “delete[d] and modifie[d] enough of Windows 98” so as to prevent “the software code that formerly had been executed in the course of providing Web browsing functionalities” from being loaded into memory and executed,²⁹⁶ even though it did not delete shared software files that served as platform software for Windows 98’s operating system functionalities and for other application programs.²⁹⁷ Although this account of Prof. Felten’s courtroom demonstration does not supply an explicit definition of the Internet Explorer software product, it implicitly regards Internet Explorer as equivalent to the ability of a user to cause software code to be loaded into memory and executed for the purpose of providing Internet Explorer’s functionalities, according to the accompanying documentation.²⁹⁸

Finally, the court devoted several findings to describing the nature of competition in the “market for Web browsing functionality.”²⁹⁹ Responding to Microsoft’s contention that consumers would benefit from industry standardization on a “best of breed” implementation of Web browsing functionalities, the court identified numerous aspects of “Web browser technology” that could be expected for the foreseeable future to remain the subject of continuing independent development and innovation by Microsoft’s competitors.³⁰⁰ In particular, the court determined that because “consumers . . . frequently lack adequate information to enable them to assess accurately the costs, risks, and benefits of performing a particular Web transaction,” they will benefit from future “innovations in Web browser technology that help them assess these costs, risks, and benefits prior to performing the transaction.”³⁰¹ Such innovations, the court concluded, were more likely to result from vigorous competition among rival software vendors than from Microsoft’s efforts to establish an industry standard. Citing Microsoft’s frequent release of “patches” to address security and privacy vulnerabilities in Internet Explorer, the court found “no indication that Microsoft is destined to provide a ‘best of breed’ Web browser that makes continuing, competitively driven innovations unproductive.”³⁰²

296. *Id.* at 55, ¶ 185.

297. *See id.* at 55-56, ¶¶ 183, 184, 193.

298. *See id.* at 50, ¶ 162 (“The user who launches a program, however, is ultimately responsible for causing routines to be loaded into memory and executed together to produce the program’s overall functionality.”).

299. *Id.* at 57-58, ¶¶ 194-201.

300. *See id.* at 57-58, ¶ 197.

301. *Id.*

302. *Id.* at 58, ¶ 198.

I. Conclusions of Law

On November 19, 1999, Judge Jackson referred the case for mediation before Richard Posner, Chief Judge of the Seventh Circuit Court of Appeals and one of the leading proponents of the Chicago School approach to tying.³⁰³ On the same day, Judge Jackson also invited his erstwhile special master appointee Prof. Lessig to submit an amicus brief giving his views on Microsoft's liability under the tying claim. Although these actions brought the perspectives of two highly respected legal scholars to bear on the case for several months, ultimately they had little effect on the district court's proceedings. On April 3, 2000, two days after learning that the parties had failed to reach an agreement, Judge Jackson issued his conclusions of law,³⁰⁴ finding Microsoft liable under the government's claims for monopoly maintenance, attempted monopolization, and tying, but not for exclusive dealing.³⁰⁵

In analyzing Microsoft's tying liability, Judge Jackson did not adopt the analytical approach suggested in Prof. Lessig's amicus brief,³⁰⁶ which had suggested, *inter alia*, that the court undertake a further inquiry into whether "the defendant's bundle causes the items to operate together in a way that had not been tried before."³⁰⁷ Nor did he follow the "plausible benefits" standard that his own summary judgment opinion had regarded as controlling with respect to the separate products inquiry.³⁰⁸ Instead, the court adhered to the basic four-element doctrine for per se tying liability,³⁰⁹ including the separate products test that had been set forth by the Supreme Court in *Jefferson Parish*.³¹⁰ First, having determined in the findings of fact that there was sufficient separate demand to make it efficient for software vendors "to provide an operating system and a browser separately, or at least in separable form," the court concluded that "Windows and Internet Explorer [should] be deemed 'separate products' for a finding of technological tying liability."³¹¹ Second,

303. See POSNER, *supra* note 199, at 171.

304. *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30 (D.D.C. 2000).

305. See *id.* at 56.

306. Brief of Professor Lawrence Lessig as Amicus Curiae, *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30 (D.D.C. 2000) (No. 98-1233).

307. *Id.* at 33 (quoting X AREEDA, *supra* note 169, ¶ 1746, at 224). For an evaluation of this suggestion in the context of the first principles approach, see *infra* text accompanying notes 670-72.

308. See *supra* note 208 and accompanying text; J. Gregory Sidak, *An Antitrust Rule for Software Integration*, 18 YALE J. ON REG. 1, 74 (2001) (noting that "Judge Jackson repudiated that legal conclusion").

309. See *supra* text accompanying note 92.

310. See *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 21-22 (1984).

311. *United States v. Microsoft Corp.*, 87 F. Supp. 2d at 50-51.

noting his findings that Microsoft had “conditioned the provision of a license to distribute Windows on the OEMs’ purchase of Internet Explorer,”³¹² the court concluded that “consumers were forced to pay, one way or another, for the browser along with Windows” and that Microsoft forced “licensees, including consumers, . . . to take, and pay for, the entire package of software.”³¹³ Third, the court’s finding that Microsoft “possesse[d] monopoly power in the worldwide market for Intel-compatible PC operating systems” led him to infer that Microsoft, *a fortiori*, also had sufficient market power to force purchasers to accept the combination.³¹⁴ Finally, the court noted that it had not specified a dollar volume that Microsoft’s refusal to offer Internet Explorer separately from Windows had foreclosed to competitors in the tied product market, but it had found that those practices “caused Navigator’s usage share to drop substantially from 1995 to 1998,” resulting in “a severe drop in revenues from lost advertisers, Web traffic and purchases of server products.”³¹⁵ Accordingly, the court concluded that the requirement of an effect on a substantial amount of commerce in the tied product had been met.³¹⁶

Despite suggestions to the contrary in his summary judgment opinion,³¹⁷ Judge Jackson determined that the D.C. Circuit did not intend its “plausible benefits” standard for finding an “integrated product” under the 1994 consent decree to control the separate products inquiry in *Microsoft*.³¹⁸ Moreover, he found the test “to be inconsistent with the pertinent Supreme Court precedents.”³¹⁹ Accordingly, Judge Jackson relied solely on Supreme Court doctrine for his conclusion that Windows 98 was a bundle of separate operating system and Web browser software products.³²⁰ Indicating

312. *Id.* at 50 (citing Findings of Fact 158-65, 170-72, 202, 213). Notably, Judge Jackson did not cite the commingling of browsing-specific code with operating system routines as a predicate act of conditioning. *See infra* text accompanying note 343.

313. United States v. Microsoft Corp., 87 F. Supp. 2d at 50.

314. *Id.* at 49.

315. *Id.*

316. *See id.* at 49-50.

317. United States v. Microsoft Corp., No. CIV.A. 98-1232, 1998 WL 614485, at *10 (D.D.C. Sept. 14, 1998) (“The D.C. Circuit clearly appears to have adopted Microsoft’s proposed ‘technological tying’ standard [in the contempt case].”).

318. United States v. Microsoft Corp., 87 F. Supp. 2d at 47 (“The court of appeals’ observations on the extent to which software product design decisions may be subject to judicial scrutiny in the course of § 1 tying cases are in the strictest sense *obiter dicta*, and are thus not formally binding.”).

319. *Id.*

320. *See id.* at 48-49.

that the D.C. Circuit's "integrated product" test was, in his view, entirely irrelevant to the separate products inquiry, he made no mention of the fact that he had earlier found an absence of plausible benefits attributable to the challenged tie,³²¹ and even used the term "integrated" to describe the combination of Windows and Internet Explorer in Windows 98.³²²

The conclusions of law abandoned the distinction Judge Jackson drew in the findings of fact between a Web browser software product (which provides Web browsing functionality) and its accompanying software (which resides on a computer's hard drive).³²³ In describing the tie as the forcing of "licensees, including consumers, . . . to take, and pay for, the entire package of software,"³²⁴ Judge Jackson indicated that the Internet Explorer software product was simply "software" that had been combined with the Windows operating system software product into the Windows 98 "package."

The court made no mention of the tie's effect on the competition among software vendors, including Netscape, to develop and market improved implementations of Web browsing functionality; that is, competition in the tied product market as it was described in the findings of fact.³²⁵ Instead, the court described the tie's purpose and effect exclusively in the context of the government's theory that the installation of Navigator's software, if sufficiently widespread, would threaten Microsoft's operating systems monopoly.³²⁶ Judge Jackson characterized the Navigator software product as platform software, describing it as a "partial substitute[]" for Windows operating system platform software that "bore the potential . . . to open up the [operating system software] product market to competition."³²⁷ He emphasized that the "true" competitive concern with the tie was the harm to Navigator's position as a potential platform competitor to Windows,³²⁸ noting that "[a] company able to

321. See *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 55, ¶ 186 (D.D.C. 1999) ("No consumer benefit can be ascribed . . . to Microsoft's refusal to offer a version of Windows 95 or Windows 98 without Internet Explorer, or to Microsoft's refusal to provide a method for uninstalling Internet Explorer from Windows 98.").

322. *United States v. Microsoft Corp.*, 87 F. Supp. 2d at 51.

323. See *supra* text accompanying notes 295-98.

324. *United States v. Microsoft Corp.*, 87 F. Supp. 2d at 50.

325. See *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 57-58, ¶¶ 194-201; see also *id.* at 103, ¶ 379 (finding that Microsoft's exclusionary conduct "deterred Netscape from undertaking technical innovations that it might otherwise have implemented in Navigator").

326. See *supra* text accompanying note 221.

327. See *United States v. Microsoft Corp.*, 87 F. Supp. 2d at 51 n.6.

328. See *id.* ("This Court has been at pains to point out that the true source of the threat posed to the competitive process by Microsoft's bundling decisions

leverage its substantial power in the tying product market in order to force consumers to accept a tie of partial substitutes is thus able to spread inefficiency from one market to the next.”³²⁹

This emphasis on platform competition was also apparent elsewhere in Judge Jackson’s analysis of the attempted monopolization claim. The government’s proposed conclusions of law had identified the relevant market that Microsoft had attempted to monopolize as “the market for Web browsing functionality” that was described in the court’s findings of fact.³³⁰ Judge Jackson, however, concluded that Microsoft had attempted to monopolize “the browser market” by trying to stop Netscape from “developing platform-level browsing software for the 32-bit versions of Windows,” and thereby exiling Netscape from “the market for browsing technology for Windows.”³³¹ Thus, the district court’s conclusions of liability for both attempted monopolization and tying were based on injuries to competition in a market for platform software that, while termed “the browser market,” was conceptually distinct from “the market for Web browsing functionality” described in the findings of fact. Overall, Judge Jackson’s conclusions of law reflect a substantial divergence from analytical conceptions of the tying claim found in his previous *Microsoft* opinions.³³²

J. Judge Jackson’s Final Judgment

On April 28, 2000, the district court received the plaintiffs’ proposed final judgment,³³³ which called for structural and conduct relief including the separation of Microsoft’s “Operating Systems

stems from the fact that a competitor to the tied product bore the potential, but had not yet matured sufficiently, to open up the tying product market to competition.”).

329. *Id.* (citing X AREEDA, *supra* note 169, ¶ 1747c, at 232). This position was also squarely in conflict with Judge Jackson’s finding on summary judgment that Microsoft’s only “incentive” in combining its PC operating system and Web browser software products was “to extract all possible monopoly profits.” *See supra* note 201 and accompanying text.

330. Pls.’ Joint Proposed Conclusions of Law at 66, *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30 (D.D.C. 2000) (No. 98-1232) [hereinafter Pls.’ Proposed Conclusions of Law] (citing *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 58, ¶¶ 199-201).

331. *See United States v. Microsoft Corp.*, 87 F. Supp. 2d at 45.

332. Another commentator has noted “internal tensions, if not contradictions” in Judge Jackson’s conclusions of law regarding the other claims in the case. *See Timothy J. Brennan, Do Easy Cases Make Bad Law? Antitrust Innovations or Missed Opportunities in United States v. Microsoft*, 69 GEO. WASH. L. REV. 1042, 1075-77 (2001).

333. Pls.’ Proposed Final Judgment, *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30 (D.D.C. 2000) (No. 98-1232).

Business” from its “Applications Business.”³³⁴ Microsoft’s proposed final judgment,³³⁵ filed May 10, 2000, consisted entirely of conduct remedies, primarily prohibitions against certain exclusionary provisions in the company’s software license agreements.³³⁶

Judge Jackson moved swiftly to a final judgment. After a one-day hearing involving the attorneys but no witnesses, Judge Jackson entered a slightly revised version of the government’s proposal as his final judgment on June 7, 2000.³³⁷ In an accompanying opinion, Judge Jackson expressed his expectation that the divestiture plan would serve “to terminate the unlawful conduct, to prevent its repetition in the future, and to revive competition in the relevant markets,” while Microsoft’s proposed remedies were “plainly inadequate” to address these objectives.³³⁸

K. Appeal from Judge Jackson’s Final Judgment

Microsoft appealed Judge Jackson’s findings of fact, conclusions of law, and final judgment to the D.C. Circuit Court of Appeals, which heard the case *en banc*. In a *per curiam* opinion issued on June 28, 2001, the Court of Appeals affirmed the district court’s conclusions of liability on the monopoly maintenance claim, reversed on the attempted monopolization claim, and reversed and remanded on the tying claim.

1. All Findings of Fact Upheld

On appeal, Microsoft challenged very few of Judge Jackson’s findings of fact.³³⁹ While noting that the findings were “exceedingly sparing in citations to the record,” the Court of Appeals held that the findings permitted meaningful appellate review under the

334. *See id.* at 2.

335. Microsoft Corporation’s Proposed Final Judgment, *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30 (D.D.C. 2000) (No. 98-1232).

336. *See id.* at 3-4.

337. *United States v. Microsoft Corp.*, 97 F. Supp. 2d 59, 63-74 (D.D.C. 2000); *see also* *United States v. Microsoft*, 253 F.3d 34, 48 (D.C. Cir. 2001) (“The District Court adopted plaintiffs’ proposed remedy without substantive change.”).

338. *United States v. Microsoft Corp.*, 97 F. Supp. 2d at 63.

339. *See* *United States v. Microsoft Corp.*, 253 F.3d 34, 52 (D.C. Cir. 2001) (“[In] many of the company’s monopoly power claims . . . the company [often] fails to challenge the District Court’s factual findings, or to argue that these findings do not support the court’s conclusions.”). The Court of Appeals acknowledged only three of Microsoft’s challenges to the findings of fact. *See id.* at 65-66 (citing *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 50 ¶ 161, 170-172 (D.C. Cir. 2001)) (discussing Microsoft’s challenge to finding that Microsoft “plac[ed] code specific to Web browsing in the same files as code that provided operating system functions”).

deferential clear error standard.³⁴⁰ The court did not find any of the findings clearly erroneous.³⁴¹ In particular, the Court of Appeals accepted Judge Jackson's findings of fact concerning Microsoft's conduct in implementing the challenged tie, and restated them in summary form as follows:

- (1) Microsoft required licensees of Windows 95 and 98 also to license IE as a bundle at a single price;
- (2) Microsoft refused to allow OEMs to uninstall or remove IE from the Windows desktop;
- (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; and
- (4) Microsoft designed Windows 98 to override the user's choice of default web browser in certain circumstances.³⁴²

The Court of Appeals took note of the fact that Judge Jackson's conclusions of law did not identify the commingling of browser-specific code with operating system routines in the software accompanying Windows 98 as a basis for tying liability.³⁴³

2. *Jefferson Parish Separate Products Test Rejected*

The Court of Appeals took a more critical view of Judge Jackson's legal analysis of the tying claim, beginning with a lengthy "exegesis" of the Supreme Court's *Jefferson Parish* approach to the separate products inquiry in the context of a per se tying liability analysis.³⁴⁴ The court explained that separate demand is observed "[o]nly when the efficiencies from bundling are dominated by the benefits to choice for enough consumers" and bundling by firms without market power is observed "only when the cost savings from joint sale outweigh the value consumers place on separate choice."³⁴⁵ Thus, in determining whether there is "sufficient consumer demand

340. *United States v. Microsoft Corp.*, 253 F.3d at 118.

341. *See New York v. Microsoft Corp.*, 224 F. Supp. 2d 76, 98 (D.D.C. 2002) (noting that "all of the district court's factual findings survived challenge on appeal").

342. *United States v. Microsoft Corp.*, 253 F.3d at 84-85 (citations omitted).

343. *See United States v. Microsoft Corp.*, 253 F.3d at 85.

344. *Id.* at 85-88.

345. *Id.* at 87-88.

so that it is efficient for a firm to provide them separately,”³⁴⁶ the efficiency of separate provision may be inferred either from direct evidence of separate demand or from the existence of a “competitive fringe” in which other firms offer the items separately.³⁴⁷ In either case, according to the court, the *Jefferson Parish* test serves neither as “a direct inquiry into the efficiencies of a bundle” nor “a one-sided inquiry into the cost savings from a bundle.”³⁴⁸ Rather, the separate products inquiry functions as a “rough proxy for whether a tying arrangement may, on balance, be welfare-enhancing, and unsuited to per se condemnation” or, in other words, as a “screen” that removes “false positives” from condemnation under the per se rule.³⁴⁹

Thus, the *Jefferson Parish* test has the effect of accounting for possible “efficiencies from bundling,”³⁵⁰ even though the test does not call for such efficiencies to be analyzed directly or even identified explicitly.³⁵¹ Given the strong interest in administrative simplicity that justifies per se rules of antitrust illegality, the D.C. Circuit recognized that this lack of precision in the *Jefferson Parish* test’s balancing of “cost savings against reduction in consumer choice” is, as a general matter, both necessary and acceptable.³⁵² According to the Court of Appeals, however, the specific facts of *Microsoft* presented an exception to this rationale for the consumer demand test.

Of particular concern to the court was the test’s apparent inability to account for the benefits attributed by Microsoft to the design of Windows 98. The court described Microsoft’s combination of Web browser and operating system as an “integration,” this time using the term “in the rather simple sense of converting individual goods into components of a single physical object (for example, a computer as it leaves the OEM, or a disk or sets of disks), without any normative implication that such integration is desirable or

346. Memorandum and Order at *7, *United States v. Microsoft Corp.*, 165 F.3d 952 (D.D.C. Sept. 14, 1998) (No. CIV.A.98-1232) (quoting *Eastman Kodak Co. v. Image Tech. Servs.*, 504 U.S. 451, 462 (1992)), available at 1998 WL 614485.

347. *United States v. Microsoft*, 253 F.3d at 87-88 (quoting X AREEDA, *supra* note 169, ¶ 1744c4, at 200).

348. *Id.* at 88.

349. *Id.*

350. *Id.* at 87.

351. *See id.* at 88 (“In describing the separate-products test we discuss efficiencies only to explain the rationale behind the consumer demand inquiry.”).

352. *See id.* (“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.” (citations omitted)).

achieves special advantages.”³⁵³ The court noted that, at least according to Microsoft, this “innovative and beneficial” integration could only have been achieved by the challenged act of “requir[ing] non-removal of IE” by the user.³⁵⁴

Microsoft had also argued that the continued existence of a separate demand and supply for Web browsers did not demonstrate the net inefficiency of the challenged tie, but instead was due to the fact that “no other firm ha[d] invested the resources to integrate web browsing as deeply into its OS as Microsoft.”³⁵⁵ Since it would follow from Microsoft’s argument that “looking to a competitive fringe is inadequate to evaluate fully [Microsoft’s] potentially innovative technological integration,” the court concluded that Microsoft’s argument “poses a legitimate objection to the operation of *Jefferson Parish’s* separate-products test for the per se rule.”³⁵⁶ While this conclusion did not amount to a finding “that Microsoft’s integration is welfare-enhancing or that it should be absolved of tying liability,” the court determined that it would “heed Microsoft’s warning that the separate-products element of the per se rule may not give newly integrated products a fair shake.”³⁵⁷

3. *Per Se Rule Rejected*

Next, the court addressed the larger question of whether the Supreme Court’s standard for per se tying liability³⁵⁸ was applicable to the tying arrangement challenged in *Microsoft*. The Court of Appeals observed that the Supreme Court establishes per se rules of illegality “only after considerable experience with certain business relationships,”³⁵⁹ and that, in contrast, “the sort of tying arrangement attacked here is unlike any the Supreme Court has considered.”³⁶⁰ In the subsequent discussion, the Court of Appeals no longer referred to the specific acts challenged under the tying claim, and instead characterized the entire tying arrangement as “the integration of additional software functionality into an OS.”³⁶¹

353. *Id.* at 88-89.

354. *Id.* at 89.

355. *Id.* at 88.

356. *Id.* at 89.

357. *Id.*

358. *See supra* text accompanying note 92. Notably, the D.C. Circuit did not join other circuits in identifying “anticompetitive effects” in the tied product market as an element of a per se tying violation. *See supra* notes 94-95 and accompanying text.

359. *United States v. Microsoft Corp.*, 253 F.3d at 90 (quoting *Broadcast Music, Inc. v. Columbia Broad. Sys., Inc.*, 441 U.S. 1, 9 (1979)).

360. *Id.*

361. *Id.* at 89.

According to the Court of Appeals, the tying arrangement in *Microsoft* was unique in two respects. First, “the tied good [was] physically and technologically integrated with the tying good.”³⁶² Finding a “paucity of cases examining software bundling” involving physical and technological integration,³⁶³ the court concluded that “judicial ‘experience’ provid[ed] little basis” for per se condemnation of the challenged tie.³⁶⁴ Second, Microsoft had argued that the tie “improved the value of the tying product to users *and* to makers of complementary goods.”³⁶⁵ While the court expressly declined to “pass judgment on Microsoft’s claims regarding the benefits from integration of its APIs,”³⁶⁶ it concluded that “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.”³⁶⁷

The Court of Appeals also found a per se analysis problematic because

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.³⁶⁸

More generally, the court expressed concern that the per se rule’s “truncated analysis” might ignore “efficiencies [that] are common in technologically dynamic markets where product development is especially unlikely to follow an easily foreseen linear pattern.”³⁶⁹

Based on these objections and concerns, the court vacated Judge Jackson’s finding of per se tying liability and remanded the case for consideration of the tying claim under the rule of reason.³⁷⁰ The court expressly confined its holding regarding the inapplicability of the per se rule “to the tying arrangement before us, where the tying

362. *Id.* at 90.

363. *Id.* at 92.

364. *Id.* at 90-91.

365. *Id.* at 90.

366. *Id.*

367. *Id.* at 93.

368. *Id.* at 92.

369. *Id.* at 94.

370. *See id.*; *see also supra* text accompanying note 98 (noting residual rule-of-reason theory of liability for tying arrangements that survive scrutiny under per se rule).

product is software whose major purpose is to serve as a platform for third-party applications and the tied product is complementary software functionality.”³⁷¹

4. *Plaintiffs’ Burden Elevated on Remand*

The D.C. Circuit’s instruction to analyze tying liability under the rule of reason rather than the per se rule would impose additional burdens of proof on the plaintiffs. Specifically, the plaintiffs would have to show that on balance, the conduct challenged under the tying claim³⁷² harmed competition “in the tied good market, the putative market for browsers.”³⁷³ This in turn would require the plaintiffs to define the “tied good market”³⁷⁴ and to show the tie’s effect on entry barriers into that market.³⁷⁵

At trial, the plaintiffs had not been expected to make these showings to support their theory of per se tying illegality.³⁷⁶ In connection with their claim that Microsoft attempted to monopolize “the market for Web browsing functionality,”³⁷⁷ however, the “plaintiffs were required—and had every incentive—to provide both a definition of the browser market and barriers to entry to that market” but in the view of the Court of Appeals, “they failed to do so.”³⁷⁸ In this regard, the Court of Appeals found that Judge Jackson’s implicit definition of a Web browser software product—“a Web browser provides the ability for the end user to select, retrieve, and perceive resources on the Web”³⁷⁹—was not “detailed” enough to serve as a basis for defining a relevant market.³⁸⁰ According to the Court of Appeals, this “imprecision” was

371. *United States v. Microsoft Corp.*, 253 F.3d at 95.

372. *See supra* text accompanying note 342.

373. *United States v. Microsoft Corp.*, 253 F.3d at 95 (citations omitted).

374. *See id.* (citing *Jefferson Parish v. Hyde*, 466 U.S. 2, 29 (1984)).

375. *See Jefferson Parish*, 466 U.S. at 29 n.48 (citing the Supreme Court’s objection to the *Jefferson Parish* plaintiff’s failure to prove anything “concerning the contract’s effect on entry barriers”); *cf.* *United States v. Microsoft Corp.*, 253 F.3d at 95 (suggesting that “certain aspects of tying injury may depend on . . . a showing of barriers to entry other than the tying arrangement itself”).

376. In a per se analysis, the foreclosure requirement is based on the dollar volume of tied sales, and does not require the delineation of a tied product market or a showing of a foreclosed share of the tied product market. *See IX AREEDA, supra* note 90, ¶ 1721b1, at 268-70.

377. Pls.’ Proposed Conclusions of Law at 66, *United States v. Microsoft Corp.*, 97 F. Supp. 2d 59 (D.D.C. 2000) (Civ. No. 98-1232) (filed Dec. 6, 1999); *see also supra* text accompanying note 330.

378. *United States v. Microsoft Corp.*, 253 F.3d at 95.

379. *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 48, ¶ 150 (D.D.C. 1999).

380. *United States v. Microsoft Corp.*, 253 F.3d at 81.

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).³⁸¹

Moreover, in emphasizing the role of Web browser software in platform competition so heavily in his conclusions of law,³⁸² Judge Jackson had neglected to provide "an examination of the substitutes that are part of the market and those that are not" and had "employed varying and imprecise references to the 'market for browsing technology for Windows,' 'the browser market,' and 'platform-level browsing software.'"³⁸³

The Court of Appeals instructed that the plaintiffs, having failed to make the necessary showings at trial in connection with the attempted monopolization claim, would be precluded on remand "from arguing any theory of harm that depends on a precise definition of browsers or barriers to entry . . . other than what may be implicit in Microsoft's tying arrangement."³⁸⁴

The Court of Appeals specifically noted that the overriding of the user's choice of default browser could be challenged on remand as an independent tying violation.³⁸⁵ This appeared to indicate more generally that the plaintiffs would not be required to challenge "the integration of additional software functionality into an OS,"³⁸⁶ but only the specific acts Judge Jackson identified as predicates to the tying violation.³⁸⁷

Finally, the Court of Appeals instructed that the plaintiffs have an opportunity on remand to "resolve the tension" between Judge Jackson's contradictory determinations as to whether Microsoft had charged more for the Windows 98 package than it would have charged for its operating system software product alone.³⁸⁸ If the plaintiffs could show that Microsoft in fact did so, and that the anticompetitive effects outweighed any procompetitive justifications, then Microsoft could be held liable under the rule of reason for the

381. *Id.* at 81-82.

382. *See supra* text accompanying note 331.

383. *United States v. Microsoft Corp.*, 253 F.3d at 81 (citing *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30, 45 (D.D.C. 2000)).

384. *United States v. Microsoft Corp.*, 253 F.3d at 95.

385. *Id.* at 96.

386. *Id.* at 89; *see also supra* text accompanying note 361.

387. *See supra* text accompanying note 342.

388. *United States v. Microsoft Corp.*, 253 F.3d at 96.

additional tying violation of “price bundling.”³⁸⁹

5. Sherman Act Section 2 Liability Upheld for Some Challenged Tying Conduct

Despite its vacatur of Judge Jackson’s holding of liability under the tying claim, the Court of Appeals affirmed Microsoft’s liability for monopoly maintenance under section 2 of the Sherman Act. Thus, the Court of Appeals joined the district court in condemning, as predicates to the monopoly maintenance claim, some of Microsoft’s specific actions that had been challenged under both the tying claim and the monopoly maintenance claim. Specifically, the Court of Appeals held that the license restrictions prohibiting OEMs from uninstalling or removing IE from the Windows desktop,³⁹⁰ and the withholding from consumers of the ability to remove IE via the Add/Remove Programs utility³⁹¹ were both section 2 violations. The D.C. Circuit also held that the commingling of browsing-specific code with operating system routines in the software accompanying Windows 98 violated section 2,³⁹² although the same was not found to be a tying violation by Judge Jackson.³⁹³

The Court of Appeals found the override of the user’s choice of default Web browser to be anticompetitive,³⁹⁴ but then turned to examine Microsoft’s proffered justifications for the override.³⁹⁵ The Court of Appeals credited testimony by Microsoft’s Senior Vice President James Allchin that “[t]he Windows 98 Help system and Windows Update feature depend on ActiveX controls not supported by Navigator,” and that “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*.”³⁹⁶ The court also credited Microsoft’s representation in its opening appellate brief that these were “valid technical reasons” for the override, and found that the plaintiffs had offered no rebuttal to this proffered justification.³⁹⁷ Accordingly, the court held that Microsoft could not

389. *Id.*

390. *Id.* at 64.

391. *Id.* at 67.

392. *Id.*

393. *Id.* at 85.

394. *Id.* at 65.

395. *Id.* at 66-67.

396. *See id.* at 67 (quoting Appellant’s Opening Brief at 82, *United States v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001) (Nos. 00-5212, 00-5213), but omitting internal citations to Allchin’s testimony).

397. *See id.* at 67.

be held liable under section 2 “for this aspect of its product design,”³⁹⁸ even though it had expressly left open the possibility of liability under section 1.³⁹⁹

6. *Final Judgment Vacated*

Even though the district court’s grant of equitable relief was entitled to deference under the abuse of discretion standard, the Court of Appeals took issue with Judge Jackson’s remedies decree.⁴⁰⁰ The Court of Appeals found that Judge Jackson abused his discretion when he failed to conduct an evidentiary hearing to resolve factual disputes regarding the likely results of the parties’ proposed final judgments⁴⁰¹ and when he failed to explain adequately how his remedies decree would accomplish its stated objectives.⁴⁰² Also, because Judge Jackson did not indicate which, if any, of his remedies were required to rectify each of the alleged antitrust violations, the Court of Appeals was unable to sustain his decree on the basis of liability conclusions that had been sustained only in part.⁴⁰³ Accordingly, the Court of Appeals vacated the remedies in its entirety and remanded the case to the district court to “fashion an appropriate remedy . . . in light of our modification of the original liability decision.”⁴⁰⁴

On remand, the D.C. Circuit instructed that the district court “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.”⁴⁰⁵ In particular, the Court of Appeals called on the district court to “consider whether plaintiffs have established a sufficient causal connection between Microsoft’s anticompetitive conduct, and its dominant position in the OS market.”⁴⁰⁶ The Court of Appeals also noted that in the absence of such a showing, the district court “may well conclude that divestiture is not an appropriate remedy.”⁴⁰⁷

398. *Id.*

399. *See supra* text accompanying note 385.

400. *See* United States v. Microsoft Corp., 253 F.3d at 104-05.

401. *Id.* at 101-03.

402. *Id.* at 103. Even though the Court of Appeals found that “[n]owhere did the District Court discuss the objectives the Supreme Court deems relevant,” *id.*, Judge Jackson did identify those objectives in his remedies opinion, albeit without providing further explanation. *See supra* text accompanying note 338.

403. *See* United States v. Microsoft Corp., 253 F.3d at 103-05.

404. *Id.* at 105.

405. *Id.* at 105 (quoting III AREEDA, *supra* note 112, ¶ 653(b), at 91-92).

406. *Id.* at 106.

407. *Id.* at 107.

7. Judge Jackson Disqualified

Finally, the D.C. Circuit reviewed press accounts in which Judge Jackson had expressed his views about the case in a number of interviews and public speeches, in some instances before entering final judgment.⁴⁰⁸ Even though the reports had not been entered into evidence, plaintiffs did not dispute them. Noting the “strong federal policy to preserve the actual and apparent impartiality of the federal judiciary,”⁴⁰⁹ the court assumed the truth of the press accounts,⁴¹⁰ concluded that Judge Jackson had committed judicial misconduct,⁴¹¹ and disqualified him from the case retroactive to the date he entered his final judgment.⁴¹² As a result of the disqualification, the district court re-assigned the case on remand to Judge Colleen Kollar-Kotelly.

L. Judge Kollar-Kotelly’s Final Judgments

The plaintiffs did not take up the challenge of proving illegal tying under the D.C. Circuit’s rule of reason standard. In a joint status report filed September 20, 2001, the plaintiffs abandoned their tying claim and their demand for structural relief.⁴¹³ Assistant Attorney General Charles A. James, who had taken over the Antitrust Division from Joel Klein in June, explained the decision to drop the tying claim in the Fall 2001 issue of *Antitrust*:

The attempted monopolization count was gone and, based on the court of appeals’ decision and the need to move to the remedy phase as quickly as possible, we dropped the tying claim. Those two claims had been a direct assault on Microsoft’s ability to compete outside of the operating system—in particular, its ability to *integrate* new functions into Windows. But the court of appeals had made it clear that, albeit with some limits, Microsoft could lawfully *integrate* new functions into the operating system and use the advantages flowing from its knowledge and design of the operating system to compete in downstream markets. What was left in the case was a series of individual practices directed against competing browser developers and others, which the court of appeals found to be unlawful because of their potential to protect the

408. *See id.* at 107-11.

409. *Id.* at 108.

410. *Id.* at 109.

411. *See id.* at 115-16.

412. *Id.* at 117.

413. Joint Status Report at 2, *United States v. Microsoft Corp.*, 224 F. Supp. 2d 76 (D.D.C. 2002) (No. CIV.A. 98-1233) (filed Sept. 20, 2001), available at <http://www.usdoj.gov/atr/cases/f9000/9085.pdf> (last visited March 3, 2005).

operating system monopoly. That was the conduct to be remedied; not the existence of the Microsoft operating system monopoly itself and not the prospect that Microsoft might come to dominate other downstream markets for reasons unrelated to its conduct protecting the operating system franchise.⁴¹⁴

James's article did not supply a definition of the term *integrate*.

Judge Kollar-Kotelly subsequently referred the case for mediation to Eric Green, a law professor at Boston University. As a result of mediation, Microsoft, the United States, and nine of the state plaintiffs (the "settling states") agreed on a proposed settlement. The remaining nine states⁴¹⁵ and the District of Columbia (the "litigating states") challenged the sufficiency of the settlement and argued for a broader set of remedies. Thus, the *Microsoft* litigation on remand proceeded on two independent tracks.

In the first track, Judge Kollar-Kotelly treated the proposed settlement as a consent decree for Tunney Act purposes⁴¹⁶ and, accordingly, conducted Tunney Act proceedings⁴¹⁷ to review the proposed settlement (the "Second Revised Proposed Final

414. Charles A. James, *The Real Microsoft Case and Settlement*, ANTITRUST, Fall 2001, at 60 (emphasis added). The Justice Department later gave a more cursory explanation of the decision to drop the tying claim in its Competitive Impact Statement, filed in connection with the Tunney Act proceedings. See *United States v. Microsoft Corp.*, 66 Fed. Reg. 59,452, 59,461 (Dep't Justice, Antitrust Div. Nov. 28, 2001) (Revised Proposed Final J. & Competitive Impact Statement) (explaining that plaintiffs dropped the tying claim "after careful consideration of the Court of Appeals' decision and its likely impact on prospective remedies, in an effort to obtain prompt, effective and certain relief for consumers"); see also *Massachusetts v. Microsoft Corp.*, 373 F.3d 1199, 1248 (D.C. Cir. 2004) (finding this explanation sufficient for Tunney Act purposes).

415. Two of the twenty original state plaintiffs had been dismissed by the time of the remand. South Carolina withdrew from the case in 1999, and New Mexico entered into a settlement with Microsoft in 2001. Joe Wilcox, *Government Seeks to Speed Microsoft Case*, at <http://news.com.com/2100-1001-269922.html?legacy=cnet> (July 13, 2001).

416. According to John J. Flynn and Darren Bush, the settlement was more accurately characterized as a proposed final judgment to remedy proven violations of the Sherman Act, rather than as a consent decree, which has usually been understood as a "voluntary settlement[] negotiated between defendants and the Government and adopted by the Court *prior to trial*." Flynn & Bush, *supra* note 11, at 763. Flynn and Bush argue that under Judge Kollar-Kotelly's mischaracterization of the settlement, "the DOJ can usurp the statutory authority of the court under § 4 of the Sherman Act to determine the appropriate remedy and confer that power unto itself by labeling a proposed final judgment a 'consent decree.'" *Id.* at 813.

417. See *supra* note 117 and accompanying text.

Judgment” or “SRPFJ”).⁴¹⁸ Over opposition from the litigating states, as well as a number of OEMs, software vendors, and members of the public who submitted comments to the Justice Department,⁴¹⁹ Judge Kollar-Kotelly determined that the SRPFJ (except for a provision limiting the court’s continuing jurisdiction) was in the public interest.⁴²⁰ On November 12, 2002, she entered the SRPFJ, with a further revision to reflect her jurisdictional concern, as her final judgment with respect to the first track.⁴²¹

In the second track, Microsoft submitted the SRPFJ as its proposed remedy, while the litigating states submitted a more extensive set of proposals for injunctive relief.⁴²² After conducting a thirty-two-day evidentiary hearing to consider the competing proposals,⁴²³ Judge Kollar-Kotelly rejected most of the litigating states’ proposals for additional remedies. Her final judgment in the second track, issued on November 1, 2003, reflected only minor changes from the SRPFJ.⁴²⁴

1. Microsoft’s Proposed Remedies

Even though the litigating states complained that Microsoft’s illegal acts had been “highly successful . . . in establishing Internet Explorer as the dominant browser” with a ninety percent share of “the browser market,”⁴²⁵ their decision to abandon the tying claim precluded any remedies for harms to competition in that market. Because Microsoft’s liability for illegal monopoly maintenance was

418. Second Revised Proposed Final J., *United States v. Microsoft Corp.*, 231 F. Supp. 2d 144 (D.D.C. 2002) (No. CIV.A. 98-1232) (filed Feb. 27, 2002), available at <http://news.corporate.findlaw.com/hdocs/docs/microsoft/usms0227022drvsfj.pdf> [hereinafter Second Revised Proposed Final J.].

419. The Justice Department received a total of 33,867 public comments either supporting or opposing the proposed settlement. *United States v. Microsoft*, 67 Fed. Reg. 23,654 (Dep’t Justice, Antitrust Div. May 3, 2002) (Pub. Comments).

420. See *New York v. Microsoft Corp.*, 231 F. Supp. 2d 203, 206 (D.D.C. 2002); *United States v. Microsoft Corp.*, 231 F. Supp. 2d 144, 149 (D.D.C. 2002).

421. Compare *United States v. Microsoft Corp.*, No. CIV.A. 98-1232, 2002 WL 31654530 (D.D.C. 2002), with Second Revised Proposed Final J., *supra* note 418.

422. *New York v. Microsoft Corp.*, 224 F. Supp. at 112.

423. *Id.* at 87.

424. Compare *id.* at 266-77 with Second Revised Proposed Final J., *supra* note 418.

425. Pl. Litigating States’ Proposed Findings of Fact at 384, ¶ 1066, *New York v. Microsoft Corp.*, 224 F. Supp. 2d 76 (D.D.C. 2002) (No. CIV.A. 98-1233) (filed June 10, 2002), available at http://www.state.ia.us/government/ag/latest_news/releases/june_2002/States%20Proposed%20Findings%20%20Public.pdf.

now the sole basis for remedy, the available remedies were generally limited in scope to the market for Intel-based PC operating system software products.⁴²⁶ Accordingly, most of the SRPFJ's substantive provisions were prohibitions against contractual practices that Microsoft had been found to have used in forestalling the middleware threat to its operating systems monopoly,⁴²⁷ and only one provision addressed the inclusion of a Web browser software product in Windows 98.⁴²⁸

The proposed decree defined seven categories of platform software, including four types of middleware, without drawing any distinction between software code and software products.⁴²⁹ Judge

426. See *New York v. Microsoft Corp.*, 224 F. Supp. 2d at 192 (“Plaintiffs are mistaken in thinking that the imposition of § 2 liability under the Sherman Act for unlawful monopoly maintenance in the market for Intel-compatible PC operating systems permits the Court to impose a remedy in areas unrelated to the monopoly market.”).

427. See *supra* text accompanying notes 218-21.

428. See *infra* text accompanying notes 433-35.

429. The SRPFJ defined the following categories of software:

“Microsoft Middleware” means software code that . . . Microsoft distributes separately from a Windows Operating System Product to update that Windows Operating System Product [and] . . . provides the same or substantially similar functionality as a Microsoft Middleware Product.

. . . “Microsoft Middleware Product” means the functionality provided by Internet Explorer, Microsoft’s Java Virtual Machine, Windows Media Player, Windows Messenger, Outlook Express and their successors in a Windows Operating System Product, [their equivalents in any future Windows Operating System Product, and] . . . functionality provided by Microsoft software that [was distributed separately from a Windows Operating System Product, and] . . . is similar to the functionality provided by a Non-Microsoft Middleware Product

. . . “Microsoft Platform Software” means (i) a Windows Operating System Product and/or (ii) a Microsoft Middleware Product.

. . . “Non-Microsoft Middleware” means a non-Microsoft software product running on a Windows Operating System Product that exposes a range of functionality . . . through published APIs, and that could, if ported to or made interoperable with, a non-Microsoft Operating System, thereby make it easier for applications that rely in whole or in part on the functionality supplied by that software product to be ported to or run on that non-Microsoft Operating System.

. . . “Non-Microsoft Middleware Product” means [Non-Microsoft Middleware] . . . of which at least one million copies were distributed in the United States within the previous year.

. . . .

. . . “Operating System” means the software code that, *inter alia*, (i) controls the allocation and usage of hardware resources . . . of a Personal Computer, (ii) provides a platform for developing

Kollar-Kotelly described the various types of middleware as generalized abstractions for Navigator, Sun's JVM, and their Microsoft counterparts, which captured the salient characteristics of the middleware threat and Microsoft's illegal acts in response to that threat:

The term "Non-Microsoft Middleware" is noteworthy for the breadth of its coverage of software products without limitation as to specific types of functionality. Consistent with the liability phase, these software products are principally limited by the requirement that they run on Microsoft's monopoly product—Windows, while exposing a range of functionality through published APIs.

....

... The one-million-copies distribution requirement in the definition of "Non-Microsoft Middleware Products" is reflective of the treatment of middleware threats in this case because the district and appellate courts did not merely focus on any software with the potential to serve as a multi-purpose platform, but specifically focused on middleware which could "gain widespread use based on its value as a complement to Windows."

....

... The term "Microsoft Middleware Product," as defined in the SRPFJ, focuses upon software technologies which have

applications by exposing functionality . . . through APIs, and (iii) supplies a user interface that enables users to access functionality of the operating system and in which they can run applications.

....

... "Windows Operating System Product" means the software code (as opposed to source code) distributed commercially by Microsoft for use with Personal Computers as Windows 2000 Professional, Windows XP Home, Windows XP Professional, and successors to the foregoing The software code that comprises a Windows Operating System Product shall be determined by Microsoft in its sole discretion.

Second Revised Proposed Final J., *supra* note 418, § VI. Notably, the defined terms did not maintain a distinction between software products and their accompanying software. For example, the defined terms "Microsoft Platform Software" and "Non-Microsoft Middleware" both purport to refer to software products. *See id.*

been incorporated or “integrated” into the Windows operating system, in reflection of the fact that the two technologies principally at issue during the liability phase were mirrored by Microsoft technologies that had been incorporated into Windows.

. . . Microsoft’s remedy proposal uses the term “Microsoft Middleware,” which is largely reflective of the definition of “Microsoft Middleware Product,” but which is further limited to the *code* separately distributed and trademarked or marketed as a major version of the Microsoft Middleware Product. SRPFJ § VI.J. The term “Microsoft Middleware” is used . . . in conjunction with a provision that requires Microsoft to disclose . . . all of the interfaces relied upon by “Microsoft Middleware” to obtain services from Windows In order to distinguish between . . . portions of Windows that coexist within the same piece of software, the definition of “Microsoft Middleware” identifies the relevant software by its code.⁴³⁰

Using these defined terms, the SRPFJ prohibited Microsoft from retaliating against other companies for, or restricting other companies by agreement from, various actions that could lead to the wider development, licensing, distribution, and use of “Non-Microsoft Middleware,” “non-Microsoft Operating Systems,” “software that competes with Microsoft Platform Software,” and “software that competes with Microsoft Middleware.”⁴³¹

430. *New York v. Microsoft Corp.*, 224 F. Supp. 2d at 114-16 (citations omitted).

431. *See* Second Revised Proposed Final J., *supra* note 418, § III.A (prohibiting Microsoft from retaliating against OEMs that develop, distribute, promote, use, sell, or license software that competes with Microsoft Platform Software or distribute Non-Microsoft Middleware or non-Microsoft Operating Systems); *id.* § III.B (reinforcing prohibition against retaliation by requiring Microsoft to offer Windows licenses to twenty largest OEMs under uniform terms); *id.* § III.C (prohibiting Microsoft from restricting by contract OEM licensees from installing means for launching Non-Microsoft Middleware or non-Microsoft Operating Systems); *id.* § III.F (prohibiting Microsoft from retaliating against software or hardware vendors that develop, use, distribute, promote, or support software that competes with Microsoft Platform Software, or restraining such vendors by contract from the same actions as a condition for the grant of Consideration); *id.* § III.G (prohibiting Microsoft from conditioning the grant of Consideration on the distribution, promotion, use or support, exclusively or in a fixed percentage, of any Microsoft Platform Software, unless it is commercially practicable to provide greater distribution, promotion, use or support for software that competes with Microsoft Platform Software); *id.* § III.I (requiring Microsoft to license any implicated intellectual property rights under

The SRPFJ also imposed affirmative duties on Microsoft. It required Microsoft to disclose certain APIs, documentation and communications protocols that other companies may need to develop software that competes with Microsoft Middleware and interoperates with a Windows Operating System Product.⁴³² It also required Microsoft to modify Windows XP by adding a facility for “enabling or removing access . . . and altering default invocations . . . with regard to each . . . Microsoft Middleware Product or Non-Microsoft Middleware Product.”⁴³³ This latter requirement was, however, subject to the proviso that Microsoft would retain the right to override a user’s default choice of any Non-Microsoft Middleware Product that

fails to implement a reasonable technical requirement (*e.g.*, a requirement to be able to host a particular ActiveX control) that is necessary for valid technical reasons to supply the end user with functionality consistent with a Windows Operating System Product, provided that the technical reasons are described in a reasonably prompt manner to any ISV [independent software vendor] that requests them.⁴³⁴

The decree further provided that the meaning of the term “Windows Operating System Product” was to be left to Microsoft’s sole discretion.⁴³⁵ This requirement was the SRPFJ’s only provision to require the modification of any of Microsoft’s software and the only one to address the inclusion of a Web browser software product in Windows 98.

2. *The Litigating States’ Proposed Remedies*

Citing the need for remedies that “seek to restore the competitive balance” for non-Microsoft middleware,⁴³⁶ are “forward-looking with respect to technological and marketplace developments,”⁴³⁷ provide “strict requirements for internal compliance, strong incentives, and an enforcement mechanism,”⁴³⁸

reasonable and non-discriminatory terms).

432. *See id.* §§ III.D.-E.

433. *Id.* § III.H.1.

434. *Id.* § III.H.2.

435. *Id.* § VI.U (“The software code that comprises a Windows Operating System Product shall be determined by Microsoft in its sole discretion.”).

436. Pl. Litigating States’ Remedial Proposals at 4, *United States v. Microsoft Corp.*, 231 F. Supp. 2d 144 (D.D.C. 2002) (No. CIV.A. 98-1232) (filed Dec. 7, 2001), *available at* <http://cyber.law.harvard.edu/msdoj/states-remedy.pdf> [hereinafter Pl. Litigating States’ Remedial Proposals].

437. *Id.*

438. *Id.* at 39.

and avoid “carefully crafted carve-outs and exceptions,”⁴³⁹ the litigating states proposed twenty-one remedies in addition to those contained in the SRPFJ. The states’ remedies were based on terms that were defined more broadly than their counterparts in the SRPFJ.⁴⁴⁰

439. *Id.*

440. Paragraph 22 of the Plaintiff Litigating States’ Remedial Proposals included, *inter alia*, the following definitions:

d. “Bind” means to include software or a link to Web-Based Software in an Operating System Product in such a way that either an OEM or an end user cannot readily remove or uninstall the binary code of that software or link without degrading the performance or impairing the functionality of such software or the Operating System.

e. “Browser” means software that, in whole or part, provides the functionality present in any version of Internet Explorer or MSN Explorer offered on either Macintosh or Windows. . . .

. . . .

i. “Default Middleware” means Middleware configured to launch automatically (that is, “by default”) to provide particular functionality in the event that the user has not selected specific Middleware for this purpose.

. . . .

w. “Middleware” means software . . . that operates directly or through other software within an Operating System or between an Operating System (whether or not on the same computer) and other software (whether or not on the same computer) by offering services via APIs or Communication Interfaces to such other software, and could, if ported to or made Interoperable with multiple Operating Systems, enable software products written for that Middleware to be run on multiple Operating System Products.

x. “Microsoft Middleware Product” means . . . Internet browsers, e-mail client software, media creation, delivery and playback software, instant messaging software, voice recognition software, digital imaging software, directories, Exchange, calendaring systems, systems and enterprise management software, Office, Handheld Computing Device synchronization software, . . . or . . . Middleware distributed by Microsoft that . . . is, or in the three years preceding this Judgment has been, distributed separately from an Operating System Product, any successors thereto, or . . . provides functionality similar to that provided by Middleware offered by a Microsoft competitor.

y. “Microsoft Platform Software” means a Windows Operating System Product or Microsoft Middleware Product or any combination [thereof].

. . . .

bb. “Operating System” means the software that controls the allocation and usage of hardware resources (such as memory, central processing unit time, disk space, and peripheral devices) of a computer (including without limitation Personal Computers, servers and Handheld Computing Devices) or network, providing a “platform”

Five of the states' proposals addressed the inclusion of a Web browser software product in Windows 98. First, Microsoft would be prohibited from conditioning the licensing of Windows on the licensing of any "Microsoft Middleware Product."⁴⁴¹ Second, Microsoft would be required to provide the end user the ability to replace "Microsoft Middleware" with "non-Microsoft Middleware" as "the Default Middleware for any functionality."⁴⁴² Third, Microsoft would not be permitted to "[b]ind any Microsoft Middleware Products to the Windows Operating System [Product]" unless it also offered to license "an otherwise identical version of the Windows Operating System Product that omit[ted] any [requested] combination of Microsoft Middleware Products."⁴⁴³ Fourth, Microsoft would be required to "disclose and license all source code for all Browser products and Browser functionality."⁴⁴⁴ Finally, Microsoft would be required to provide advance notice of "any action that it knows, or reasonably should know, will directly or indirectly, interfere with or degrade the performance or compatibility of any non-Microsoft Middleware when Interoperating with any Microsoft Platform Software other than for good cause."⁴⁴⁵

3. Judge Kollar-Kotelly's Decision

While agreeing with the litigating states that "an appropriate remedy may be forward looking and address conduct beyond the specific acts found to be anticompetitive," Judge Kollar-Kotelly found that the states had "shown little respect for the parameters of liability that were so precisely delineated by the appellate court."⁴⁴⁶

by exposing APIs that applications use to "call upon" the Operating System's underlying software routines in order to perform functions.

cc. "Operating System Product" means an Operating System and additional software shipped with the Operating System, whether or not such additional software is sold separately.

...

rr. "Windows Operating System Product" means software code (including source code and binary code, and any other form in which Microsoft distributes its Windows Operating Systems for Personal Computers) of Windows 95, Windows 98, Windows 2000 Professional, Windows Me, Windows XP and their successors . . . , as distributed by Microsoft to any licensee, whether or not such product includes software code of any one or more Microsoft Middleware Products.

Id. at 32-37, ¶ 22.

441. *Id.* at 13, ¶ 7.

442. *Id.* at 15, ¶ 10.

443. *Id.* at 5, ¶ 1.

444. *Id.* at 17, ¶ 12.

445. *Id.* at 12, ¶ 5.

446. *New York v. Microsoft Corp.*, 224 F. Supp. 2d 76, 192 (D.D.C. 2002).

She rejected most of the states' proposals in their entirety,⁴⁴⁷ including all five of the proposals relating to the inclusion of a Web browser software product in Windows 98.⁴⁴⁸

Judge Kollar-Kotelly described the ban on contractual tying as "more appropriate as a remedy for a finding of section 1 liability for the illegal tying of products."⁴⁴⁹ Since the tying claim was not pursued on remand, there was no such finding of liability on which to base the remedy.⁴⁵⁰ Judge Kollar-Kotelly also noted the D.C. Circuit's observation that "there are often efficiencies and other benefits to be gained from a tie"⁴⁵¹ and found from the evidence that "tying in the software market often produces a benefit to consumers."⁴⁵²

As for the plaintiffs' proposal regarding the availability of replaceable defaults, Judge Kollar-Kotelly cited the D.C. Circuit's "rejection of [section 2] liability for Microsoft's practice of overriding the user's choice of a 'default browser' where there exist 'valid technical reasons' for doing so."⁴⁵³ She found that the proposed remedy would prohibit Microsoft from legitimate conduct including, *inter alia*, "enabl[ing] 'users to move seamlessly from local storage devices to the Web in the same browsing window'"⁴⁵⁴ and that the plaintiffs did not provide "evidence of a particular competitive benefit to be gained" from the prohibition.⁴⁵⁵

447. See generally *id.* at 151-92. Judge Kollar-Kotelly adopted two of the states' substantive remedial proposals in part. Compare *id.* at 154-56 with Pl. Litigating States' Remedial Proposals, *supra* note 436, at 8-9, ¶¶ 2.c.i, 2.c.iii (adopting sections of proposal requiring Microsoft to permit Internet access provider registration during the initial boot sequence and the automatic launch of non-Microsoft programs after the initial boot sequence); and compare United States v. Microsoft Corp., 224 F. Supp. 2d at 168 with Pl. Litigating States' Remedial Proposals, *supra* note 436, at 13-14, ¶ 8 (adopting proposal to prohibit Microsoft from threatening retaliation against independent software and hardware vendors for supporting competing products).

448. See New York v. Microsoft Corp., 224 F. Supp. 2d at 187 (rejecting ban on contractual tying); *id.* at 159-62 (rejecting proposal regarding the availability of replaceable defaults); *id.* at 156-59 (rejecting requirement that Microsoft offer to remove any requested combination of Microsoft Middleware Products); *id.* at 185-86 (rejecting requirement that Microsoft disclose the source code for all Browser products); *id.* at 186 (rejecting ban on knowing interference with middleware performance or compatibility).

449. *Id.* at 187.

450. See *id.* at 258.

451. *Id.* at 187.

452. *Id.*

453. *Id.* at 160 (citing United States v. Microsoft Corp., 253 F.3d 34, 67 (D.C. Cir. 2001)).

454. *Id.* at 160-61 (quoting United States v. Microsoft Corp., 253 F.3d at 67).

455. *Id.* at 161.

In proposing that Microsoft be required to “omit[] any [requested] combination of Microsoft Middleware Products,” the litigating states intended that Microsoft would have to identify and remove “the binary code of that software” from the Windows code.⁴⁵⁶ This proposal therefore revisited the longstanding problem of identifying the lines of software code that constitute Internet Explorer. Judge Kollar-Kotelly noted that the government had refused to identify the lines of code that constitute Internet Explorer in the software accompanying Windows 98,⁴⁵⁷ and that the D.C. Circuit in the contempt case had tentatively found that the browser had no separate existence in Windows 95 with Internet Explorer.⁴⁵⁸ Although Judge Kollar-Kotelly did not conclude from this litigation history that “it is a technologically impossible task to separate the code,” she found that “clear definitions between the items to be separated” were necessary for the court to know “whether the required unbinding has been achieved.”⁴⁵⁹ She also credited Microsoft’s testimony that the removal of platform software from the Windows operating system would “impose[] an entirely new model of product design for Microsoft’s operating system products”⁴⁶⁰ and would “disrupt the industry, harming both [software vendors] and consumers.”⁴⁶¹ Finally, Judge Kollar-Kotelly noted Judge Jackson’s finding that using the Add/Remove feature in Windows 95 to remove end-user access to Internet Explorer “was equivalent to removing the Internet Explorer program from Windows 95,” even though the feature did not remove all of the “browsing specific code” in Windows, as the litigating states were now requesting.⁴⁶²

Judge Kollar-Kotelly described the proposed requirement that Microsoft disclose the source code for all Browser products as a “divestiture[] of Microsoft’s primary asset—intellectual property”⁴⁶³ that would benefit Microsoft’s competitors rather than consumers.⁴⁶⁴ Recalling the D.C. Circuit’s advice that a divestiture remedy would

456. Pl. Litigating States’ Remedial Proposals, *supra* note 436, at 5, ¶ 1; at 31, ¶ 22d.

457. *See* New York v. Microsoft Corp., 224 F. Supp. 2d at 157 n.64.

458. *See id.* (citing United States v. Microsoft Corp., 147 F.3d 935, 951-52 (D.C. Cir. 1998)).

459. *Id.* at 157.

460. *Id.* at 255; *see also id.* at 157 (“Microsoft presented significant evidence, which the Court credits, that such separation . . . would be a significant undertaking.”).

461. *Id.* at 157-58.

462. *Id.* at 158-59 (citing United States v. Microsoft Corp., 84 F. Supp. 2d 9, 50-51, ¶ 165 (D.D.C. 1999)).

463. *Id.* at 186.

464. *See id.* at 185.

be warranted only if the district court was convinced of the causal connection between the liability findings and Microsoft's operating system monopoly,⁴⁶⁵ Judge Kollar-Kotelly determined that Judge Jackson had found only an "indirect" causal connection⁴⁶⁶ and that the litigating states had failed to bolster his finding sufficiently to justify a divestiture of any Microsoft asset.⁴⁶⁷ She also specifically rejected the litigating states' argument that Internet Explorer's market success was at least predominantly attributable to Microsoft's illegal conduct.⁴⁶⁸

Finally, Judge Kollar-Kotelly determined that the proposed ban on knowing interference with middleware performance or compatibility was potentially ambiguous and would require the court to involve itself in product design.⁴⁶⁹ She also found the litigating states' justifications for the provision to be "weak at best, with a non-existent link to the liability in this case and an insufficiently clear benefit to competition."⁴⁷⁰

M. Appeal from Judge Kollar-Kotelly's Final Judgments

Of the nine litigating states (and the District of Columbia), only Massachusetts and West Virginia filed notices of appeal from Judge Kollar-Kotelly's final judgments. The remaining seven states reportedly accepted a payment of \$28.6 million from Microsoft for their incurred legal fees and prospective enforcement expenses in exchange for their agreement not to appeal.⁴⁷¹ West Virginia subsequently settled with Microsoft for \$21 million in vouchers for computer hardware and software products, leaving Massachusetts as the sole remaining plaintiff in the case.⁴⁷²

465. *Id.* at 186 (citing *United States v. Microsoft Corp.*, 253 F.3d 34, 107 (D.C. Cir. 2001)).

466. *Id.* at 185.

467. *Id.* at 186.

468. *See id.* at 185 n.81.

469. *Id.* at 186.

470. *Id.* at 256.

471. *See* Jonathan Krim, *Microsoft Offered States a Fee Deal*, WASH. POST, Dec. 14, 2002, at E1.

472. *See* Jonathan Krim, *States vs. Microsoft: Then There Was One*, WASH. POST, June 17, 2003, at E1. Joining Massachusetts were two industry organizations, the Computer and Communications Industry Association and the Software and Information Industry Association, which had filed motions to intervene for the purpose of appealing the district court's determination that the SRPFJ was in the public interest. *See* *Massachusetts v. Microsoft Corp.*, 373 F.3d 1199, 1204 (D.C. Cir. 2004). Judge Kollar-Kotelly had twice denied their motions to intervene in the case. *See* *United States v. Microsoft Corp.*, No. CIV.A. 98-1232, 2002 WL 319139, at *1 (D.D.C. Feb. 28, 2002) (denying motion to intervene in Tunney Act proceeding, but granting alternative motion to

On appeal, Massachusetts argued that the district court had abused its discretion by failing to fashion an adequate remedy.⁴⁷³ Massachusetts did not specifically call for a review of each of the five litigating states' proposed remedies addressing the inclusion of a Web browser software product in Windows 98, but two of Massachusetts's arguments apparently pertained to the district court's denial of those remedies. First, Massachusetts argued that the district court failed to remedy the commingling of browser-specific code with operating system routines in the software accompanying Windows 98.⁴⁷⁴ Second, Massachusetts alleged that the district court failed to deny Microsoft the fruits of its illegal conduct directed at Netscape Navigator.⁴⁷⁵

The D.C. Circuit, once again sitting en banc, heard oral arguments on November 4, 2003 and issued an opinion on June 30, 2004, written for the court by Circuit Judge Douglas H. Ginsburg.⁴⁷⁶ In what was to be the last published opinion in the epic case,⁴⁷⁷ the court affirmed Judge Kollar-Kotelly's remedial decree in its entirety.⁴⁷⁸

Regarding the commingling issue, the court held that it was within Judge Kollar-Kotelly's discretion to remedy the effect of the commingling of code, rather than the commingling itself.⁴⁷⁹ According to the court, Microsoft's commingling had the exclusionary effect of discouraging OEMs from installing, and consumers from using, rival middleware.⁴⁸⁰ The court also noted Judge Jackson's finding that "from the user's perspective, uninstalling Internet Explorer [with the Add/Remove Programs utility is] equivalent to removing the Internet Explorer program

participate as amicus curiae); *United States v. Microsoft Corp.*, No. CIV.A.98-1232, 2003 WL 262324 (D.D.C. Jan. 11, 2003) (denying motion to appeal district court's judgment in Tunney Act proceeding). On appeal, the D.C. Circuit reversed the district court's denial of the latter motion to intervene and considered the associations' appeal of the public interest determination on the merits, ultimately rejecting all of their objections. *United States v. Microsoft Corp.*, 373 F.3d at 1204.

473. See Brief for Pls.-Appellants at 14, *Massachusetts v. Microsoft Corp.*, 373 F.3d 1199 (D.C. Cir. 2004) (Nos. 02-7155, 7156) (filed May 5, 2003), available at 2003 WL 22340413.

474. *Id.* at 18-21.

475. *Id.* at 35-38.

476. *Massachusetts v. Microsoft Corp.*, 373 F.3d at 1199.

477. Massachusetts did not timely file a petition for certiorari. See Andrew Chin, *A Case of Insecure Browsing*, NEWS & OBSERVER (Raleigh), Sept. 30, 2004, at 13A.

478. *Massachusetts v. Microsoft Corp.*, 373 F.3d at 1204.

479. *Id.* at 1209.

480. See *id.* at 1209-10.

from Windows.”⁴⁸¹ In the D.C. Circuit’s view, by requiring Microsoft to add a facility for “enabling or removing access . . . and altering default invocations”⁴⁸² with respect to Internet Explorer and other middleware products, Judge Kollar-Kotelly’s decree was “entirely consistent” with Judge Jackson’s finding⁴⁸³ and successfully remedied the anticompetitive effect of commingling “without intruding itself into the design and engineering of the Windows operating system.”⁴⁸⁴

In concluding that the decree provided the end user with an option that was essentially “equivalent to removing the Internet Explorer program from Windows,” the Court of Appeals carefully avoided addressing the proviso that allowed Microsoft to override a user’s default choice of middleware product under certain circumstances that were to be specified by Microsoft.⁴⁸⁵ The court specifically omitted the proviso from its quotation of section III.H.2 of the decree, the middleware access remedy.⁴⁸⁶ The court did acknowledge the testimony of AOL’s Peter Ashkin that under the decree, end users who had chosen non-Microsoft middleware would continue to experience unintended invocations of Microsoft middleware. The court concluded, however, that

[t]he accidental invocations of Microsoft middleware claimed in the Ashkin testimony—to the extent not already resolved by § III.H.2—are hardly likely to generate the level of support costs OEMs faced when the IE icon was on every desktop. Certainly the cited testimony is no evidence of such significant costs.⁴⁸⁷

Since, under the decree, all of the unintended invocations of Microsoft middleware described by Ashkin would necessarily be *authorized* by the override proviso of section III.H.2, it is a contradiction in terms to speak of these problems as being to some

481. *Id.* at 1209 (quoting *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 51, ¶ 165 (D.D.C. 1999)).

482. Second Revised Proposed Final J., *supra* note 418, § III.H.1.

483. *Massachusetts v. Microsoft Corp.*, 373 F.3d at 1209.

484. *Id.* at 1210.

485. *Id.* at 1209 (quoting *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 51, ¶ 165); *see supra* text accompanying notes 434-35.

486. *See Massachusetts v. Microsoft Corp.*, 373 F.3d at 1209 (“[U]nder § III.H.2 end users and OEMs may ‘designate a Non-Microsoft Middleware Product to be invoked in place of [a] Microsoft Middleware Product . . . in any case where the Windows Operating System Product would otherwise launch the Microsoft Middleware Product’”) (ellipses in original).

487. *Id.* at 1210.

extent “*already resolved* by section III.H.2.”⁴⁸⁸ The D.C. Circuit thereby managed to trivialize the social costs of the override proviso without accurately characterizing the proviso’s effects or analyzing (or even stating) its terms.

Regarding the fruits of Microsoft’s illegal conduct, the Court of Appeals accepted Judge Kollar-Kotelly’s finding that the plaintiffs had failed to establish that Internet Explorer’s market success was at least predominantly attributable to Microsoft’s antitrust violations.⁴⁸⁹ The Court of Appeals concluded that the true fruit of Microsoft’s illegal conduct was “freedom from the possibility that rival middleware vendors would pose a threat to its monopoly of the market for Intel compatible PC operating systems”;⁴⁹⁰ accordingly, Judge Kollar-Kotelly’s decree was correctly focused on the goal of “opening the channels of distribution for rival middleware.”⁴⁹¹

Of course, four long years had already passed since Judge Jackson’s conclusions of law turned a blind eye to the effects of Microsoft’s illegal conduct on competition in the market for Web browser software products.⁴⁹² It was far too late for the D.C. Circuit to revisit the issue.

N. Summary

Judge Jackson’s findings of fact, affirmed in their entirety by the D.C. Circuit, specifically rejected Microsoft’s litigation position that “software products consist of code and nothing else.”⁴⁹³ Eventually, however, this specious argument came to influence every court and party in the litigation and to control the destiny of the *Microsoft* tying claim.

The misconception began working its mischief in the drafting of the 1995 consent decree,⁴⁹⁴ which immunized Microsoft’s development of “integrated products.”⁴⁹⁵ In the ensuing contempt case,⁴⁹⁶ the Court of Appeals construed the term “integrated product” so expansively as to include all combinations of two software products in which “the code that is required to produce one [set of

488. *Id.* (emphasis added).

489. *Id.* at 1232; *see supra* text accompanying note 468 (discussing Judge Kollar-Kotelly’s finding).

490. *Massachusetts v. Microsoft Corp.*, 373 F.3d at 1233.

491. *Id.*

492. *See supra* text accompanying notes 325-32.

493. *Microsoft’s Proposed Findings of Fact*, at 263-64, at ¶ 569; *see also supra* text accompanying notes 295-98 (discussing Microsoft’s position).

494. *See supra* Part III.C.

495. *United States v. Microsoft Corp.*, 147 F.3d 935, 939 (D.C. Cir. 1998); *see supra* text accompanying note 129.

496. *See supra* Part III.D.

functionalities] also produces the other.”⁴⁹⁷ At the same time, the Court of Appeals ruled that Microsoft was entitled to claim every useful software functionality supported by this shared code as a “plausible benefit” of the challenged combination⁴⁹⁸ and stated in dicta that its construction of the consent decree was “consistent with tying law.”⁴⁹⁹

The D.C. Circuit’s conflation of product with code in the contempt case cast a long shadow over the *Microsoft* antitrust proceedings. In Judge Jackson’s summary judgment opinion, he indicated that he would regard the D.C. Circuit’s dicta as controlling with respect to the separate products issue.⁵⁰⁰ While he would later abandon this position,⁵⁰¹ this statement effectively directed the parties to address their tying cases to the Court of Appeals’s “integrated product” test.

Accordingly, at trial, Microsoft emphasized the “interpenetrating design” of Windows 98, marked by the incorporation of “Internet Explorer technologies”: libraries of shared code that supported a host of useful operating system and Web browsing functionalities, as well as third-party software products.⁵⁰²

The government took a radically different approach. Through their expert witness Edward Felten, they rejected the notion that software products consist of code.⁵⁰³ Instead they offered an implicit definition of the tied product in Windows 98—namely, that which confers upon a user the ability to browse the Web.⁵⁰⁴

Judge Jackson adopted⁵⁰⁵ and elaborated⁵⁰⁶ the government’s approach in his findings of fact, ultimately finding a “market for Web browsing functionality” in which consumers benefit from quality-based competition.⁵⁰⁷ In his conclusions of law, however, Judge Jackson fell back on the intuition that a software product consists of software code.⁵⁰⁸ As a result, he no longer had the

497. United States v. Microsoft Corp., 147 F.3d at 949; *see supra* text accompanying notes 157-159.

498. *See supra* text accompanying note 160.

499. United States v. Microsoft Corp., 147 F.3d at 950; *see supra* text accompanying note 166.

500. *See supra* text accompanying notes 207-08.

501. *See supra* text accompanying notes 317-18.

502. *See supra* text accompanying notes 246-71.

503. *See supra* text accompanying note 15.

504. *See supra* text accompanying note 245.

505. *See supra* text accompanying note 281.

506. *See supra* text accompanying notes 291-94.

507. United States v. Microsoft Corp., 84 F. Supp. 2d 9, 57-58 (D.D.C. 1999); *see supra* text accompanying notes 299-302.

508. *See supra* text accompanying notes 323-24.

necessary analytical basis for identifying the tied product market (that is, the “market for Web browsing functionality”) in which competition had been foreclosed by the challenged tie.⁵⁰⁹

The fallacious intuition that software products consist of code suffused the D.C. Circuit’s review of Judge Jackson’s adjudication of the tying claim. Unable to imagine that Internet Explorer could consist of anything other than lines of code, the Court of Appeals mischaracterized the tying claim as calling into question Microsoft’s decision to include shared, non-removable code in Windows 98 that supported both operating system and Web browsing functions.⁵¹⁰ Based on this premise, the court decided that Judge Jackson’s application of the *Jefferson Parish* separate-products test had not given a “fair shake” to Microsoft’s claims of benefits from the Windows 98 functionalities and third-party software products supported by this shared code.⁵¹¹

The D.C. Circuit also concluded from the sharing of code that the *Microsoft* tying arrangement was “unlike any the Supreme Court has considered,” warranting rule-of-reason treatment even in the face of prevailing Supreme Court doctrine.⁵¹² Since the same shared code supported both operating system and Web browsing functionalities in Windows 98, the court concluded that the tied and tying products were “physically and technologically integrated.”⁵¹³ Also, since the inclusion of shared code in Windows 98 supported beneficial Windows 98 functionalities and third-party products, the D.C. Circuit reasoned that there was a problematic “possibility of consumer gains” from (what the court mistakenly took to be) the challenged tie.⁵¹⁴

Given the expected difficulty of proving tying liability according to a uniquely lenient standard, while hobbled by an inadequate legal construction of the tied product market, it was perhaps to be expected that the plaintiffs would drop the tying claim on remand. In doing so, however, they appeared to acquiesce in Microsoft’s positions that software products consist of code and that the tying and tied software products in Windows 98 had been “integrated” by virtue of the sharing of code. In his *Antitrust* article, Assistant

509. See *supra* text accompanying notes 325-32.

510. See *supra* text accompanying note 354.

511. *United States v. Microsoft*, 253 F.3d 34, 89 (D.C. Cir. 2001); see *supra* text accompanying notes 355-57.

512. *United States v. Microsoft*, 253 F.3d at 90; see *supra* text accompanying notes 358-71.

513. *United States v. Microsoft*, 253 F.3d at 90; see *supra* text accompanying notes 362-64.

514. *United States v. Microsoft*, 253 F.3d at 93; see *supra* text accompanying notes 365-67.

Attorney General Charles James described the tying claim as “a direct assault on Microsoft’s ability . . . to integrate new functions into Windows.”⁵¹⁵ The Justice Department and nine states would go on to enter into a settlement with Microsoft whose terms did not distinguish between software code and software products.⁵¹⁶ The litigating states joined in the confusion, pursuing a remedy requiring Microsoft to omit any requested combination of middleware products by identifying and removing “the binary code of that software” from the Windows code.⁵¹⁷ As Judge Kollar-Kotelly correctly noted, the government had come a long way from its position at trial before Judge Jackson, when it had steadfastly refused to define the tied product in terms of lines of code.⁵¹⁸

To summarize, the litigation history of the *Microsoft* tying claim is, in large part, the story of the triumph of the notion that software products consist solely of software code. Advanced initially by Microsoft and adopted throughout the litigation by the D.C. Circuit, this durable misconception also eventually prevailed in the minds of Judge Jackson and of both the settling and the litigating plaintiffs.

This intuition prevailed, despite its falsehood, because the only available alternatives were not sufficiently explicit or detailed. The district court in its findings of fact accepted Prof. Felten’s definition of the tied product in terms of what a Web browser software product *does*—it “provides the ability for the end user to select, retrieve, and perceive resources on the Web”⁵¹⁹—but in doing so failed to enter “detailed findings defining what a browser *is*.”⁵²⁰ To inform an antitrust analysis, however, a description of a Web browser software product must explicitly identify “what constitutes a browser” and provide sufficient detail for a reviewing court to determine “why certain other products are not reasonable substitutes.”⁵²¹ Finding no answer to these questions in either Prof. Felten’s testimony or Prof. Lessig’s amicus brief, the courts and parties were left thereafter to fall back on the intuition that the software products at issue in the case consisted of software code itself.

Compounding the confusion was the fact that the government’s case addressed two separate and distinct end uses for Microsoft’s

515. James, *supra* note 414, at 58.

516. See *supra* text accompanying note 429.

517. Pl. Litigating States’ Remedial Proposals, *supra* note 436, at 5; *id.* ¶ 22d, at 31; see *supra* text accompanying note 456.

518. See *supra* text accompanying note 457.

519. *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 48, ¶ 150; see *supra* text accompanying notes 292-94.

520. *United States v. Microsoft Corp.*, 253 F.3d 34, 81 (D.C. Cir. 2001) (emphasis added).

521. *Id.* at 81-82; see *supra* text accompanying note 381.

Web browser software product: allowing a user to select, retrieve, and perceive Web resources and installing platform software (more specifically, middleware) as a precondition to running Web-based applications.⁵²² The tied product market—the “market for Web browsing functionality” described in Judge Jackson’s findings of fact—related only to the first of these end uses. In his conclusions of law, however, Judge Jackson failed to distinguish between these two end uses, muddying his analysis of the tying and attempted monopolization claims with “varying and imprecise references to the ‘market for browsing technology for Windows,’ ‘the browser market,’ and ‘platform-level browsing software.’”⁵²³ As a result, Judge Jackson understated the purpose and effect of the challenged tie, characterizing them solely in terms of the competition to install platform software.⁵²⁴

My aim in the next Part of this Article is twofold: to supplant the false intuitions that dominated the adjudication of the *Microsoft* tying claim with legally and technologically accurate and explicit definitions of software products, by drawing on first principles of antitrust law, intellectual property, and software engineering; and to show that the government could have prevailed on the tying claim, even under a rule of reason analysis on remand, by applying this first principles approach to the facts that had already been proven at trial. By relying on rigor rather than intuition, the *Microsoft* courts not only would have restored free competition in a cognizable “market for Web browsing functionality,” but also, more generally, would have established a stable and robust doctrinal foundation for competition policy in software product markets.

IV. A FIRST PRINCIPLES ANALYSIS OF THE *MICROSOFT* TYING CLAIM

This Part will revisit the question of tying liability for Microsoft’s conduct in connection with the inclusion of a Web browser software product in Windows 98. By adhering to first principles, this Part will derive a new set of legal conclusions from the same set of facts found by Judge Jackson, affirmed by the D.C. Circuit, and held to be the law of the case on remand by Judge Kollar-Kotelly. The analysis will depart from, and therefore call into question, the courts’ doctrinal conclusions regarding the characterizations of the tying and tied products in Windows 98, the markets in which they respectively compete, the status of the products under the separate products inquiry, Microsoft’s proffered

522. See *supra* text accompanying note 64.

523. *United States v. Microsoft Corp.*, 253 F.3d at 81; see *supra* text accompanying note 383.

524. See *supra* text accompanying notes 325-32.

justifications for the challenged conduct, the existence of a tying condition, and the effects of the challenged conduct on competition.

A. *The Tying and Tied Products in Windows 98*

The plaintiff who advances a theory of liability for illegal tying has the sole right—and the sole duty—to identify the alleged tying and tied products that serve as predicates for the claim. The concepts of a “tying product” and a “tied product” are therefore distinct from that of a “software product,” inasmuch as the legal rights and technological capabilities that constitute a software product are often marketing decisions made by the product’s vendor. If tying doctrine supports the plaintiff’s allegations, the fact that a vendor markets the tying product and tied products as a unitary item will not preclude a court from finding the item to be a combination of separate tying and tied products.⁵²⁵

In *Microsoft*, Judge Jackson adopted the plaintiffs’ characterization of Windows 98 as a bundle that combined Microsoft’s Web browser software product with its Intel-compatible PC operating system software product, which had previously been marketed separately under the trademarks “Internet Explorer” and “Windows,” respectively.⁵²⁶ He referred to the terms “Web browser” and “operating system” as types of software, implicitly defining each by describing its functionalities:

A “Web client” is software that, when running on a computer connected to the Internet, sends information to and receives information from Web servers throughout the Internet A “Web browser” is a type of Web client that enables a user to select, retrieve, and perceive resources on the Web.⁵²⁷

An “operating system” is a software program that controls the allocation and use of computer resources (such as central processing unit time, main memory space, disk space, and input/output channels) The operating system [also] supports the functions of applications by exposing interfaces,

525. See X AREEDA, *supra* note 169, ¶ 1741a, at 177 (citation omitted) (noting that in tying analysis, “the essence of what constitutes ‘one product’ cannot be resolved by logic, language, or physical considerations”); see also *id.* at 175 (stating that “just about any two products could be described as mere parts in a more encompassing single product”).

526. See *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 51-52, ¶¶ 166-69 (D.D.C. 1999) (describing Microsoft’s strategic decision to “bind[]” Internet Explorer to Windows in Windows 98).

527. *Id.* at 14, ¶ 16.

called “application programming interfaces,” or “APIs.”⁵²⁸

While these implicit definitions are sufficient to characterize the alleged tying and tied products, it is also possible to articulate explicit definitions as legal conclusions drawn from the foregoing findings of fact, which follow directly from the scope of copyright exclusivity in the relevant software.⁵²⁹

As a matter of law, the sale of a software product does not confer ownership of the accompanying software, but only the necessary legal rights and technological capabilities to install and run the software on a system according to the documentation.⁵³⁰ Specifically, an operating system software product consists essentially of a limited, nonexclusive right, and the necessary technological capabilities, to make copies and adaptations of the accompanying software code on a computer’s hard drive and in the computer’s memory for the purposes of controlling the allocation and use of computer resources and supporting the functions of applications that reference the software’s APIs.⁵³¹ A Web browser software product consists essentially of a limited, nonexclusive right, and the necessary technological capabilities, to make copies and adaptations of the accompanying software code on a computer’s hard drive and in the computer’s memory for the purposes of selecting, retrieving, and perceiving resources on the Web (collectively, “performing Web transactions”).⁵³² Accordingly, Windows 98 contains both an operating system software product and a Web browser software product,⁵³³ each of which respectively permits the limited copying and adaptation of the accompanying software for a separate and distinct set of purposes.

Three ramifications of these definitions may initially seem counterintuitive. First, a precondition for the use of Microsoft’s Web browser software product in Windows 98 is that Microsoft’s operating system software product be installed. In other words, the alleged tied product is useless without the alleged tying product. This functional dependence is unexceptional and has no bearing on tying liability.⁵³⁴

528. *Id.* at 12, ¶ 2.

529. *See generally Antitrust Analysis, supra* note 28, at 42-73.

530. *Id.* at 72-73.

531. *Id.* at 73.

532. *Id.*

533. I do not presume that the Web browser software product defined here is identical to any product or service marketed by Microsoft under the trademark “Internet Explorer.” Accordingly, I will refer to the Web browser software product in Windows 98 by the more unwieldy term “Microsoft’s Web browser software product.”

534. *See infra* text accompanying notes 634-35.

Second, as a result of Microsoft's decision to market Windows 98 as a unitary item, the same software happens to accompany two different software products. While the concept of different software products with the same accompanying software might seem novel, this situation is actually quite common in the software industry. In particular, software licenses, including Microsoft's standard end-user license agreement for Windows 98,⁵³⁵ often contain terms specifying legal restrictions on use.⁵³⁶ Digital rights management technologies, reinforced by legal prohibitions against circumvention,⁵³⁷ are increasingly being used to give effect to technological restrictions on use.⁵³⁸ The existence of such use restrictions generally benefits software vendors, who can use them to facilitate price discrimination.⁵³⁹ When different users obtain licenses to install and run the same software pursuant to different use restrictions, they thereby obtain different software products. I defer for now the question of whether such software products are "separate products" for purposes of tying doctrine.⁵⁴⁰

Third, as a result of Microsoft's decision to protect the software code accompanying Windows 98 under a single copyright, the legal rights that comprise the alleged tying and tied products are derived from the same copyright. In his summary judgment opinion, Judge Jackson noted the IBM cases of the 1960s and 1970s, in which courts generally held that "where a court is dealing with what is physically and in fact a single product,' the antitrust laws do 'not contemplate judicial dissection of that product into parts and the reconstitution of these parts into a tying agreement.'"⁵⁴¹ The identification of the operating system and Web browser software products do not involve a dissection of Windows 98's code, but

535. See End User License Agreement for Microsoft Windows 98, available at <http://info.astreet.com/copy/license.html> (last updated Mar. 12, 2000) (annotating license agreement with critical comments).

536. See 2 L.J. KUTTEN, COMPUTER SOFTWARE (2003) § 8.02[2][f][ii], at 8-34 to 8-36.

537. See 17 U.S.C. § 1201 (2000).

538. See *Antitrust Analysis*, *supra* note 28, at 23 & n.141.

539. See *id.*

540. See *infra* Part IV.D.

541. See *United States v. Microsoft Corp.*, No. CIV.A.98-1232, 1998 WL 614485, at *8 (D.D.C. Sept. 14, 1998) (quoting *Telex Corp. v. IBM Corp.*, 367 F. Supp. 258, 347 (N.D. Okla. 1973), *rev'd on other grounds*, 510 F.2d 894 (10th Cir. 1975)); *cf.* *Kenworth of Boston, Inc. v. Paccar Fin. Corp.*, 735 F.2d 622, 624 (1st Cir. 1984) ("We need not treat the concept of a 'tie' like a procrustean bed onto which this practice must be squeezed or stretched."). Judge Jackson distinguished the IBM cases by noting that IBM offered the two bundled products in their unbundled form. See *United States v. Microsoft Corp.*, 1998 WL 614485 at *9.

arguably do involve a “judicial dissection” of Microsoft’s exclusive rights in the software accompanying Windows 98 under the copyright laws. Thus, in its preemption argument, Microsoft sought to characterize the state plaintiffs’ tying challenges as an interference with Microsoft’s exclusive right to distribute its copyrighted software under section 106 of the Copyright Act.⁵⁴²

Section 106’s grant of enumerated exclusive rights, however, is expressly subject to other statutory provisions and cannot be read in isolation.⁵⁴³ Moreover, the Copyright Act does not operate to convert all products derived from a single copyright into what is “physically and in fact a single product” for purposes of antitrust analysis. Instead, the statute contemplates that rights in a single copyrighted work may be licensed so as to enable different vendors to exploit the respective demands for different uses of the work.⁵⁴⁴ Hovenkamp’s treatise on intellectual property and antitrust clearly illustrates this point:

[T]he fact that two different media are protected by the same intellectual property right does not seem to be decisive one way or another. For example, suppose a theater showing *Titanic* after videos were issued required patrons to purchase a copy of the *Titanic* video cassette as a condition of getting a seat in the theater. Ordinarily, one observes, movie tickets and video cassettes are sold separately, and this combination should be regarded as a tie of separate products.⁵⁴⁵

542. See *supra* text accompanying note 279.

543. See 17 U.S.C.A. § 106 (West Supp. 2004) (granting certain exclusive rights to the copyright owner “[s]ubject to sections 107 through 122”).

544. See *New York Times v. Tasini*, 533 U.S. 483, 505-06 (2001) (holding that a license granting the right to publish a freelance author’s article in a collective work did not extend to authorize the republication of the article in an online database). The *Tasini* Court reasoned:

Essentially, [17 U.S.C.] § 201(c) adjusts a publisher’s copyright in its collective work to accommodate a freelancer’s copyright in her contribution. If there is demand for a freelance article standing alone or in a new collection, the Copyright Act allows the freelancer to benefit from that demand; after authorizing initial publication, the freelancer may also sell the article to others.

Id. at 497.

545. HOVENKAMP ET AL., *supra* note 88, § 22.3, at 22-15. According to some courts and commentators, no tying liability should be found where the Copyright Act authorizes the bundling of the alleged tying and tied products. See, e.g., *Waldbaum v. Worldvision Enters.*, No. 76 CIV. 3772, 1978 WL 956, at *6 (S.D.N.Y. Nov. 21, 1978) (citing 17 U.S.C. §§ 1(a), 1(d) (1909)) (holding that a requirement that a licensee of films also purchase prints is “within the statutory copyright monopoly” and “does not represent a tie-in”); X AREEDA, *supra* note 169, ¶ 1749b, at 259 & n.35 (citing *Waldbaum* for the proposition that “a single product should be found when copyright law itself bundles certain

In this particular case, Microsoft's tying conduct served in part to impede competing software developers from determining which code was to be executed when consumers chose to use their products. Since the Copyright Act provides no warrant for such a restraint,⁵⁴⁶ the single copyright on Windows 98's code should not be taken to imply that Windows 98 is a single product for purposes of tying law.

B. The Tied Product Market

Although a rigorous definition of the tied product market is not required for a per se tying analysis,⁵⁴⁷ it can inform the *Jefferson Parish* inquiry into the existence of separate demand for the tied product,⁵⁴⁸ the characterization of the challenged conduct as a tying condition,⁵⁴⁹ and the measurement of the challenged conduct's effects on competition.⁵⁵⁰ A definition of the tied product market is also likely to be necessary in the event that the court decides instead to undertake a rule-of-reason analysis of the tying claim.⁵⁵¹ By applying a first principles approach to product market definition,⁵⁵² it is possible to draw legal conclusions from Judge Jackson's findings in *Microsoft* that delineate the relevant product market in which Microsoft's Web browser software product, the allegedly tied product in the Windows 98 bundle, competes, that is, the "market for Web browsing functionality."⁵⁵³

rights, such as a book or film copyright that its owner bundles with hard copies of the copyrighted work"). For present purposes, it suffices to note that the Copyright Act does not authorize the conduct at issue in *Microsoft*, see *Antitrust Analysis*, *supra* note 28, at 44, 65, and that the mere existence of a single copyright from which the alleged tying and tied products are derived is not dispositive of the tying claim.

546. See *Antitrust Analysis*, *supra* note 28, at 72.

547. See *supra* note 376 and accompanying text.

548. See *infra* Part IV.D.

549. See *infra* Part IV.E.

550. See *infra* Part IV.F.

551. See IX AREEDA, *supra* note 90, ¶ 1729g, at 396-98 (noting that "[t]he usual principles of market definition govern" the delineation of the tied product market in a rule of reason analysis). But see *United States v. Microsoft Corp.*, 253 F.3d 34, 95 (D.C. Cir. 2001) (allowing plaintiffs on remand to pursue tying claim under rule of reason standard while precluding them from delineating a precise market for Web browser software products).

552. See *supra* Part II.B.

553. *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 58, ¶ 201 (D.D.C. 1999).

1. *The Defendant's Product*

As marketed by Microsoft, Windows 98 is a software product defined by reference to accompanying software and documentation and consists essentially of sufficient legal rights, and technological capabilities, to install and run the software on a system according to the documentation.⁵⁵⁴

2. *Relevant Consumer Purposes*

Windows 98 is capable of being used for multiple consumer purposes. Consumers value Windows operating system software products (including Windows 98) primarily for their accompanying platform software (that is, the Windows operating system software),⁵⁵⁵ which must be preinstalled as a precondition to running thousands of Windows-based applications software products.⁵⁵⁶

Some, but not all, consumers also value Windows 98 because it enables a user to perform Web transactions.⁵⁵⁷ Given the emergence of the Web as a unique mass communications medium,⁵⁵⁸ the vast and growing collection of valuable digital information resources available on the Web,⁵⁵⁹ and the increasing use of Web browsers by

554. *See id.* at 13, ¶ 10 (describing licensing and installation of Microsoft's software). In most cases, the Windows 98 software was preinstalled for the end user by the personal computer manufacturer. *See id.* The term "Windows 98 software product" as used here refers to the software product marketed by Microsoft under the name "Windows 98," as defined here, without regard to the distinct question of whether Windows 98 constitutes a single product under tying doctrine.

555. *See* United States v. Microsoft Corp., 84 F. Supp. 2d. at 12, ¶ 2 (describing operating system software as a kind of platform software); *id.* at 19-20, ¶ 37 ("Consumer interest in a PC operating system derives primarily from the ability of that system to run applications [on the operating system platform].").

556. *See id.* at 20, ¶ 39. The district court in its Findings of Fact defined the "market for Intel-compatible PC operating systems" based on this primary end use. *Id.* at 14, ¶ 18. *See infra* Part IV.C.

557. *Compare* United States v. Microsoft Corp., 84 F. Supp. 2d. at 58, ¶ 201 (finding "consumer demand for Web browsing functionality"), *and id.* at 110-11, ¶ 408 (finding that "[t]he inclusion of Internet Explorer with Windows at no separate charge" benefited consumers who wanted it), *with id.* at 48, ¶ 152 (finding consumer demand for a browserless operating system), *and id.* at 53, ¶ 173 (finding that Microsoft harmed consumers who did not want Internet Explorer), *and id.* at 111, ¶ 410 (same).

558. *See id.* at 58, ¶ 200 (describing the Web as "the leading trajectory for the ongoing convergence of mass communications media" and noting the Web's offerings of "popular interactive and collaborative modes of communication that are not available through other media").

559. *See id.* at 58, ¶¶ 199-200.

consumers to perform Web transactions,⁵⁶⁰ it is clear that performing Web transactions is a complete, meaningful, and well-defined consumer purpose.

The “prototype removal program” developed by Princeton computer science professor Edward Felten demonstrated the technological ability of a hypothetical monopolist to discriminate specifically against consumers who were interested in Windows 98 for the purpose of performing Web transactions.⁵⁶¹ As revised and submitted to the court in connection with Prof. Felten’s June 1999 testimony, the program slightly modified the Windows 98 software so as to prevent copies and adaptations from being created in memory for the purpose of performing Web transactions,⁵⁶² but without degrading Windows 98’s performance or stability with respect to any other end uses.⁵⁶³ In other words, “it remains possible to remove Web browsing functionality from Windows 98 without adversely affecting non-Web browsing features of Windows 98 or the functionality of applications running on the operating system.”⁵⁶⁴ Since Microsoft could have licensed the modified version of Windows 98,⁵⁶⁵ Prof. Felten’s program served also to demonstrate Microsoft’s legal ability to discriminate against the end use of performing Web transactions. These findings imply that the end use of Windows 98 to perform Web transactions could be targeted for price discrimination,⁵⁶⁶ and can serve as the basis for a relevant product market with respect to claims alleging harms to competition among products that serve that captive end use segment.⁵⁶⁷

560. *See id.* at 58, ¶ 201.

561. *Id.* at 53-54, ¶ 177. At trial, Prof. Felten’s program was offered not to show the technological feasibility of quality-adjusted price discrimination against Web browsing, but the lack of a technological justification for Microsoft’s refusal to offer a browserless version of Windows 98. *See id.*

562. *See id.* at 54-55, ¶¶ 178, 185; *see also supra* text accompanying notes 295-98 (discussing Judge Jackson’s explanation of the removal procedure). On cross-examination, one of Microsoft’s attorneys directed Prof. Felten to demonstrate that even after the prototype removal program had been run, Web browsing functionality could still be accessed via an undocumented key sequence. *See United States v. Microsoft Corp.*, 84 F. Supp. 2d. at 54, ¶ 179. Functionalities accessible only via undocumented means, however, are not included within the scope of a software product. *See Antitrust Analysis, supra* note 28, at 26 (stating that a software product confers the right “to install and run the software on a system according to the documentation”).

563. *See United States v. Microsoft Corp.*, 84 F. Supp. 2d at 54, ¶ 181.

564. *See id.* at 53, ¶ 177.

565. *See id.*; *see also supra* text accompanying notes 535-36 (explaining that software licenses frequently contain use restrictions).

566. *See Antitrust Analysis, supra* note 28, at 34-35.

567. *See id.* at 21-24.

Note that I have already identified the software product that precisely constitutes the collection of legal rights and technological capabilities that support the use of Windows 98 to perform Web transactions: it is Microsoft's Web browser software product.⁵⁶⁸ Prof. Felten's program, which he described as a "proof of concept,"⁵⁶⁹ may therefore be seen as a crude form of digital rights management designed to remove user access to Microsoft's Web browser software product. Thus, the captive end use segment we have identified is exactly the same as the relevant product market in which Microsoft's Web browser software product competes—that is, the tied product market.

3. *Essential Use Cases*

The Web is a "collection of digital information resources stored on [Web] servers" that may be accessed by Web clients via the Internet using the HyperText Transfer Protocol ("HTTP").⁵⁷⁰ A user's access to a Web resource constitutes an economically meaningful transaction⁵⁷¹ wherein the user incurs certain costs (including search and communication costs)⁵⁷² in exchange for receiving access, and the owner of the Web resource provides access in exchange for receiving user traffic.⁵⁷³

568. *See supra* note 532 and accompanying text.

569. Tr. June 10, 1999 P.M. at *9, *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. Cir 1999) (No. CIV A 98-1232(TPJ)) (testimony of Edward W. Felten), *available at* 1999 WL 380891.

570. *See United States v. Microsoft Corp.*, 84 F. Supp. 2d at 13-14, ¶¶ 12, 16.

571. *See id.* at 57-58, ¶¶ 197, 198, 201 (using the term "Web transaction" to describe an access to a Web resource).

572. *See id.* at 57, ¶ 197.

573. *See id.* at 88, ¶ 316.

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DECODING MICROSOFT

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viewing Web page

USER ACTION	SYSTEM RESPONSE
move cursor over hyperlink click mouse button	display hyperlinks in Web page query DNS for IP address of Web server send HTTP request to Web server receive HTTP response from Web server continue until all necessary files are received
view Web page	render Web page

Figure 1. A use case for the task of viewing a Web page.

As typically designed, a Web browser allows a user to navigate to a hypertext document on the Web (known as a Web page) by pointing and clicking on a hyperlink directed to it.⁵⁷⁴ The use case in Figure 1 describes the typical sequence of user actions and system responses that take place when the user views a Web page, and then follows a hyperlink that connects it to another Web page by moving the cursor over a link and depressing the mouse button.⁵⁷⁵

Most of the specific design details in Figure 1 are not necessary for a system to serve the user purpose of performing a Web transaction. Regardless of its design and implementation, a system serves this user purpose if it “enables a user to select, retrieve, and perceive resources on the Web.”⁵⁷⁶

574. *See id.* at 14, ¶ 16.

575. *See id.*; *see also* T. Berners-Lee et al., *RFC 1945: Hypertext Transfer Protocol – HTTP/1.0* (May 1996), available at <http://www.ietf.org/rfc/rfc1945.txt>. (last visited March 1, 2004).

576. *United States v. Microsoft Corp.*, 84 F. Supp. at 14, ¶ 16 (defining a Web browser as “a type of Web client that enables a user to select, retrieve, and perceive resources on the Web”); *see also id.* at 48, ¶ 150 (“While the meaning of the term Web browser is not precise in all respects, there is a consensus in the software industry as to the functionalities that a Web browser offers a user. Specifically, a Web browser provides the ability for the end user to select,

performing Web transaction

USER INTENTION	SYSTEM RESPONSIBILITY
	present information about Web resources
select Web resource	offer choice of Web resources
retrieve Web resource	request resource from Web server
	receive resource from Web server
perceive Web resource	present Web resource

Figure 2. An essential use case for the task of performing a Web transaction.

It is necessary and sufficient, from the user's perspective, for a system that supports the task of performing a Web transaction to support the user-system interaction described in Figure 2. For a user to select a Web resource, the user must first be offered a choice of Web resources. To carry out a user's intention to retrieve a Web resource, a system must send a request to a Web server and receive the resource from the Web server.⁵⁷⁷ Finally, for a user to perceive a Web resource, it must first be presented to the user. Conversely, from the user's perspective, a system that offers the user a choice of Web resources and requests, receives and presents the user's selection, thereby serves the user purpose of performing a Web transaction.

It is straightforward to verify that Figure 2 is a structured narrative, expressed in the language of the application domain and of users, comprising a simplified, generalized, abstract, technology-free, and implementation-independent description of the user-

retrieve, and perceive resources on the Web."); *id.* at 58, ¶ 201 ("Consumer demand for software functionality that facilitates Web transactions, and the response by browser vendors to that demand, creates a market for Web browsing functionality.").

577. *See id.* at 13, ¶ 12 (finding that Web resources are "stored on servers throughout the Internet"); *id.* at 14, ¶ 16 (finding that a Web client "sends information to and receives information from Web servers throughout the Internet").

system interaction that supports the task of performing a Web transaction—that is, an essential use case.

4. *Functionally Interchangeable Products*

All software products that support the essential use case in Figure 2, regardless of their designs or implementations, are functionally interchangeable with Microsoft's Web browser software product for the purpose of performing a Web transaction.⁵⁷⁸ Besides existing software products that are marketed as Web browsers, other functionally interchangeable products include:

Shell browser software products (for example, Encompass):⁵⁷⁹ At trial, the parties referred to a distinct category of programs called "shell browsers," which "consist of a small amount of user interface code that relies on Internet Explorer to do the actual work of connecting to the Internet and displaying retrieved information."⁵⁸⁰ From the user's perspective, however, the shell browser software product itself supports the task of performing a Web transaction as described in Figure 2, inasmuch as it specifies which software runs on the system to produce the necessary user-system interaction.

Web media player software products (for example, Real Audio Player)⁵⁸¹ and *Web document reader software products* (for example, Adobe Acrobat Reader):⁵⁸² Some software products, including "media players" and "document readers," support the essential use case in Figure 2, but only when the Web resource is an instance of one of a relatively limited number of file types.⁵⁸³ The list of file types supported by such a software product is typically specified in the accompanying documentation and, therefore, constitutes a documented precondition for using the product to perform a Web transaction.⁵⁸⁴

578. See *supra* text accompanying notes 576-77.

579. See *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 54, ¶ 179.

580. Pls.' Joint Revised Proposed Findings of Fact ¶ 68.2.2.1, *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. 1999) (No. CIV.A. 98-1232); see also Def. Microsoft Corp.'s Revised Proposed Findings of Fact ¶ 425, *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. 1999) (No. CIV.A. 98-1232) (describing Encompass and SurfMonkey as "shell browsers' . . . that rely on the Internet Explorer components of Windows").

581. See *United States v. Microsoft Corp.*, 253 F.3d 34, 82 (D.C. Cir. 2001).

582. See *id.*

583. See *id.* (referring to Real Audio Player and Adobe Acrobat Reader as "viewers for individual internet extensions"). Since the appeals decision, RealNetworks, Inc. has introduced a version of the Real Audio Player called the RealOne Player, which incorporates a full-featured shell browser. Accordingly, Real Audio Player is now more accurately characterized as a Web browser software product.

584. See *Antitrust Analysis*, *supra* note 28, at 27-28.

5. *Relevant Competitive Variables*

Software products that support the essential use case in Figure 2 compete for consumer demand with respect to numerous variables, including preference and performance metrics and preconditions for use.

Product evaluations introduced by the parties⁵⁸⁵ identified various material preference and performance metrics relating to the task of performing a Web transaction: search costs, communication costs, security and privacy risks, and the accuracy of information presented about the values of transaction choices.⁵⁸⁶ The evaluations also demonstrated the importance of competition with respect to these non-price variables.

The Web is unique among all mass communications media for its ability to subsume diverse types of digital content.⁵⁸⁷ Consumers value the ability to perform Web transactions in large part because

585. The product reviews were offered in connection with Microsoft's argument that Internet Explorer's market share gains were attributable to improvements in product quality. *See* Def.'s Revised Proposed Findings of Fact ¶¶ 433-44, *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. 1999) (No. CIV.A. 98-1232); Pls.' Joint Revised Proposed Findings of Fact ¶ 381.3.1, *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. 1999) (No. CIV.A. 98-1232).

586. The district court identified features that were the subject of "continuing, competitively driven innovations" to meet consumer preferences and to benefit consumers. *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 58, ¶ 198.

Despite differences in emphasis, the product evaluations do generally concur as to which browser features are beneficial, which browser features are detrimental, and why. Thus, the evaluations provide extensive detailed information about consumer preferences First, the evaluations suggest that, although most Web publishers charge nothing for access to their sites, consumers recognize that there are search and communication costs associated with Web transactions. Accordingly, consumers prefer, and benefit from, innovations in Web browser technology that reduce these costs. Second, consumers recognize that the Web contains a vast and growing range of digital information resources, many of which contain viruses that are capable of causing devastating and irreversible harm to their security and privacy interests. Accordingly, consumers prefer, and benefit from, innovations in Web browser technology that help them identify and avoid harmful Web resources. Third, consumers recognize that they frequently lack adequate information to enable them to assess accurately the costs, risks, and benefits of performing a particular Web transaction. Accordingly, consumers prefer, and benefit from, innovations in Web browser technology that help them assess these costs, risks, and benefits prior to performing the transaction.

Id. at 57-58, ¶¶ 196-98.

587. *See id.* at 58, ¶ 200 (describing the Web as "the leading trajectory for the ongoing convergence of mass communications media" and as "subsuming all other digital media").

of the number and diversity of available Web resources.⁵⁸⁸ Any precondition that restricts a software product's support for performing Web transactions to a relatively limited number of file types is therefore material to the choice of a Web browser software product.⁵⁸⁹

Another material precondition for the use of Microsoft's Web browser software product is that Microsoft's operating system software product be preinstalled. Bearing in mind that both products are accompanied by the same Windows 98 software, this precondition simply requires that the user have sufficient technological capabilities to copy and adapt the software to support the operating system product's purposes, including the software's use as a platform.

6. Reasonable Interchangeability

Reasonable interchangeability among Microsoft's Web browser software product, Netscape Navigator, AOL's Browser, and other existing software products that are marketed as Web browsers for the Windows 98 platform can be inferred from the observed shifts in demand among these products.⁵⁹⁰ Reasonable interchangeability between Microsoft's Web browser software product and Netscape Navigator for Windows 98 can also be inferred from the reduction in the price of Netscape Navigator to zero in response to the inclusion of a Web browser software product in Windows 98 at no extra charge.⁵⁹¹ Thus, the district court's Findings of Fact provide substantial support for a finding that for the purpose of performing Web transactions, Microsoft's Web browser software product is reasonably interchangeable at least with all other existing software products that are marketed as Web browsers for the Windows 98 platform.

It is unclear from the record whether Web media player software products and Web document reader software products for

588. *See id.* at 58, ¶ 201 ("The use of Web browsers to conduct Web transactions has grown at pace with the growth of the Web, reflecting the immense value that subsists in the digital information resources that have become available on the Web.")

589. *See supra* text accompanying notes 557-60.

590. *See, e.g.*, *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 98-102, ¶¶ 359-74 (describing the shift in Web browser usage from Netscape Navigator to Internet Explorer); *id.* at 77-85, ¶¶ 273-304 (describing AOL's agreement with Microsoft to switch subscribers from a proprietary Web browser software product to Internet Explorer).

591. *See id.* at 110-11, ¶ 408 (finding that Microsoft's provision of Internet Explorer at no separate charge "compelled Netscape to stop charging for Navigator").

the Windows 98 platform are also reasonably interchangeable with Microsoft's Web browser software product. On the one hand, the narrowness of the preconditions that restrict their utility to a relatively limited number of file types may preclude a finding of reasonable interchangeability.⁵⁹² On the other hand, excellent performance with respect to a few file types (as measured by the relevant competitive variables)⁵⁹³ may compensate for incompatibility with respect to others.⁵⁹⁴ For purposes of inferring monopoly power and anticompetitive harm in this case, it appears to be immaterial whether media players and document readers are included in or excluded from the relevant product market.⁵⁹⁵ Out of an abundance of caution, it seems best to err on the side of inclusion by extending the provisional market to cover all Web browser software products for the Windows 98 platform, thereby avoiding any loss of generality from the ensuing conclusions of liability.⁵⁹⁶

592. See *Antitrust Analysis*, *supra* note 28, at 33-34.

593. See *supra* text accompanying note 586.

594. See *Antitrust Analysis*, *supra* note 28, at 14-15.

595. Although the D.C. Circuit objected to the plaintiffs' failure to explain why neither Real Audio Player nor Adobe Acrobat Reader were reasonable substitutes for a Web browser, *United States v. Microsoft Corp.*, 253 F.3d 34, 81-82 (D.C. Cir. 2001), the Court of Appeals did not indicate any implications of a contrary finding on this point. To the extent that the monopoly power and anticompetitive harm analyses require a showing of "significant barriers to entry," *id.* at 82-84, the existence or non-existence of such barriers to entry does not turn on the reasonable interchangeability of media players and document readers with Web browsers.

596. A recent district court decision suggests that at least in the case of "extremely sophisticated buyers and users of information technology . . . [with] decades of experience in negotiating in this field," a finding of reasonable non-interchangeability requires "hard evidence" regarding the actual cost to the user of adapting to the performance and preference characteristics of the excluded alternative. See *United States v. Oracle Corp.*, 331 F. Supp. 2d 1098, 1131 (N.D. Cal. 2004). In *Oracle*, the Justice Department and ten states challenged Oracle's acquisition of PeopleSoft under § 7 of the Clayton Act, alleging harms to competition in product markets for "high function software." *Id.* at 1100, 1102. The alleged product markets excluded various functionally interchangeable alternatives that failed to match certain advanced "performance capabilities" of the merging parties' products. *Id.* at 1124 (quoting *Jt. Sub. Definitions* at 2-4, *United States v. Oracle Corp.*, 331 F. Supp. 2d 1098 (N.D. Cal. 2004) (No. C04-0807)). Several customers of the merging parties testified that they required these advanced capabilities and had no viable alternative to the products in the alleged market. See *id.* at 1125-30. The court rejected this testimony, noting the lack of evidence about "how much it would cost to adapt other vendors' products to the same functionality that the Oracle and PeopleSoft products afford." *Id.* at 1131. In the absence of such evidence, the court refused to exclude the other vendors' products from the relevant product market. *Id.* at 1132.

Microsoft differs sharply from *Oracle* in that Windows and Internet Explorer are mass-market software products. Windows users typically are not

7. *Structural Barriers to Entry*

As a general matter, the research and development costs that would be required to create a new Web browser software product, with limited prospects for recoupment, represent a significant barrier to entry into the relevant product market.⁵⁹⁷ Microsoft erected further barriers to entry by designing Windows 98 to make it more difficult for other Web browser software products to achieve acceptance and to interfere with the ability of other Web browser software products to support the task of performing Web transactions.

First, Microsoft designed Windows 98 to make it prohibitively difficult for PC manufacturers to uninstall Microsoft's Web browser software product.⁵⁹⁸ This action had the anticompetitive effect of deterring PC manufacturers from installing other Web browser software products, because of the testing and technical support costs that can result from pre-installing multiple functionally interchangeable software products.⁵⁹⁹

Second, "when a user chooses a browser other than Internet Explorer as the default, Windows 98 nevertheless requires the user to employ Internet Explorer in numerous situations that, from the user's perspective, are entirely unexpected."⁶⁰⁰ In effect, Windows 98 prevents the user's choice of Web browser software product from supporting the task of performing Web transactions in accordance with its documented specifications.⁶⁰¹ The resulting "considerable uncertainty and confusion in the ordinary course of using Windows 98"⁶⁰²—a consequence intended by Microsoft⁶⁰³—constituted a

"extremely sophisticated" and lack the power to negotiate with software vendors for adaptations of their products to accommodate desired performance and preference characteristics. Still, *Oracle* indicates that the use of performance and preference metrics to delineate software product markets will be viewed with great skepticism by at least some courts.

597. See *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 47, ¶ 145 (D.D.C. 1999) ("[O]nce Microsoft and Netscape began offering browsing software for free, consumers for the most part lost all incentive to pay for it."); cf. *id.* at 103, ¶ 379 (finding that loss of revenue from licensing Navigator "deterred Netscape from undertaking technical innovations that it might otherwise have implemented in Navigator").

598. See *id.* at 50, 52, ¶¶ 161, 164, 170.

599. See *id.* at 49-50, ¶ 159; see also *United States v. Microsoft Corp.*, 253 F.3d 34, 66 (D.C. Cir. 2001) (affirming Finding ¶ 159 over Microsoft's objection, and concluding that this conduct had an anticompetitive effect).

600. *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 52, ¶ 171.

601. See *Antitrust Analysis*, *supra* note 28, at 36.

602. *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 52, ¶ 171.

603. See *id.*, at 52, ¶ 172 (finding that "Microsoft's refusal to respect the user's choice of default browser fulfilled [Microsoft Senior Vice President] Brad

significant diminution in product quality and conferred a structural advantage on Windows 98 over other Web browser software products in the “market for Web browsing functionality.”⁶⁰⁴

Finally, Microsoft designed Windows 98 so that code specific to Web browsing was commingled with code that provided operating system functions “to a greater degree than is necessary to provide any consumer benefit.”⁶⁰⁵ One consequence of this commingling is that Web-browser-specific code is loaded into dynamic memory when Windows 98 starts up. This code constitutes approximately 20 percent of Windows 98’s memory requirements and is not needed in dynamic memory unless it will be run on the system.⁶⁰⁶ Thus, to the extent that other Web browser software products specify different code to be run for the purpose of supporting a Web transaction, Windows 98 unnecessarily restricts the available memory that such products can allocate to supporting that task.⁶⁰⁷

By themselves, these barriers to entry do not demonstrate that Microsoft has monopoly power in the relevant market. They do, however, identify some of the significant difficulties facing a potential entrant into that market. Such considerations lend confidence to any inference of monopoly power, or the threat of monopoly power, from Microsoft’s dominant market share among current producers of Web browser software products.⁶⁰⁸

In a prima facie case, the first principles approach could account for all of these entry barriers in defining the relevant market in which Microsoft’s Web browser software product competes. If the Microsoft plaintiffs had pursued the tying claim on remand, however, they would have been granted the “opportunity” to identify a “browser market” in which the tying conduct had an

Chase’s 1995 promise to make the use of any browser other than Internet Explorer on Windows ‘a jolting experience’”).

604. *Id.* at 58, ¶ 201; *see also id.* at 58-59, ¶ 172 (“The decision to override the user’s selection of non-Microsoft software as the default browser also directly disinclined Windows 98 consumers to use Navigator as their default browser, and it harmed those Windows 98 consumers who nevertheless used Navigator.”).

605. *Id.* at 53, ¶ 174.

606. *See id.* at 55, ¶ 184.

607. Note that while this commingling creates a barrier to entry into the market for Web browser software products for Windows 98, it is not one of the acts challenged under the tying claim. *See supra* text accompanying note 343.

608. *Cf. United States v. Microsoft Corp.*, 253 F.3d 34, 82 (D.C. Cir. 2001) (per curiam) (“Because a firm cannot possess monopoly power in a market unless that market is also protected by significant barriers to entry . . . it follows that a firm cannot threaten to achieve monopoly power in a market unless that market is, or will be, similarly protected.”).

“anticompetitive effect,”⁶⁰⁹ while also being precluded from considering any entry barriers “other than what may be implicit in Microsoft’s tying arrangement.”⁶¹⁰ It is therefore significant that two of the identified entry barriers are implicit in the conduct challenged under the tying arrangement⁶¹¹ and could have been cited on remand in defining a tied product market in which the tying conduct had an anticompetitive effect.

8. Summary

The foregoing analysis, derived from first principles of antitrust law, intellectual property, and software engineering, and substantially supported by the district court’s Findings of Fact, has served to delineate the relevant product market in which the alleged tied product competes and from which market power and anticompetitive effects can be inferred. For a software product to be included in this market, it is necessary and sufficient for it to support the task of performing a Web transaction,⁶¹² or equivalently, to “enable[] a user to select, retrieve, and perceive resources on the Web,”⁶¹³ subject to the precondition that the Windows 98 platform software has been preinstalled. The relevant product market is therefore the market for Web browser software products for Windows 98 or, in the more intuitive but less precise terms used by the Findings of Fact, “a market for Web browsing functionality.”⁶¹⁴

C. The Tying Product Market

The tying product market in *Microsoft* was the same market that Microsoft had been charged with monopolizing under section 2—that is, the market for Intel-compatible operating system software products, in which Microsoft’s operating system software product competes—and was delineated by Judge Jackson in the context of the monopolization claim.

Judge Jackson began his analysis by identifying the preinstallation of the Windows OS platform software on an Intel-compatible PC as the primary end use for Windows 98 (step 2).⁶¹⁵ With respect to demand substitutability, he found several categories

609. *Id.* at 96.

610. *Id.* at 95.

611. *See supra* text accompanying notes 598-604.

612. *See supra* text accompanying note 577.

613. *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 14, ¶ 16 (D.D.C. 1999).

614. *Id.* at 58, ¶ 201; *see also id.* at 48, ¶ 150 (noting consensus that the functionality of a Web browser is to “provide[] the ability for the end user to select, retrieve, and perceive resources on the Web”).

615. *See supra* notes 555-56 and accompanying text.

of products to be functionally non-interchangeable with Intel-compatible PC operating system software products for the relevant consumer purpose (step 4)⁶¹⁶ and identified various relevant competitive variables that distinguish other products from Intel-compatible PC operating system software products (step 5), thereby making it unlikely that large numbers of consumers would switch to such products in the event of a price increase (step 6).⁶¹⁷ Regarding supply substitutability, he cited the difficulty of porting Windows applications to run on another platform as a structural barrier preventing other firms from developing a software product that would be functionally and reasonably interchangeable with Windows 98 for the relevant consumer purpose (step 7).⁶¹⁸

Based on these findings, Judge Jackson concluded that the relevant product market for purposes of the monopoly maintenance claim was the market for Intel-compatible PC operating system software products.⁶¹⁹ He did not begin with a precise definition of Microsoft's operating system software product (step 1) or formulate any essential use cases (step 3),⁶²⁰ but otherwise, his procedure for defining this market was similar to the one described in Part II.B. This close adherence to first principles of market definition with respect to the tying product market provided the requisite "evidentiary and theoretical rigor" to withstand review on appeal,⁶²¹

616. See *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 14-18, ¶¶ 19-26, 28-29 (finding server operating systems, non-Intel-compatible PC operating systems, information appliances, network computers, and middleware to be functionally non-interchangeable with Windows 98 for the purpose of preinstalling platform software to support the use of applications software products on an Intel-based PC).

617. See *id.* at 14-16, ¶ 19-22, 25 (additional hardware requirements); *id.* at 15-16, ¶ 23-24 (limited product features); *id.* at 17, ¶ 26 (latency, congestion, asynchrony, insecurity, and contention); *id.* at 17, ¶ 27 (variety and ease of use of applications); *id.* at 17, ¶ 28 (support for personal productivity applications).

618. See *id.* at 19-22, ¶¶ 36-44 (describing "applications barrier to entry" as that to be reasonably interchangeable with Windows 98 for the purpose of complementing applications software products, a competing operating system product would have to emulate the vast library of available Windows applications); *id.* at 18-19, ¶¶ 30-32 (finding that "the demand for a new Intel-compatible PC operating system would be severely constrained" by this applications barrier to entry); see also *id.* at 22, 24, ¶¶ 46, 52, 54 (describing difficulty of reverse-engineering the Windows OS platform software).

619. See *id.* at 14, ¶ 18.

620. Step 3 was not actually needed in the court's analysis, because the relevant end use did not require support for any tasks.

621. *United States v. Microsoft Corp.*, 253 F.3d 34, 84 (D.C. Cir. 2001). Compare *id.* at 81-82 (criticizing district court's definition of a "browser market" absent evidence identifying "the technological components of or functionalities provided by a browser" and "why certain other products are not reasonable

in sharp contrast to Judge Jackson's "varying and imprecise" legal conclusions regarding the tied product market,⁶²² which were vacated with prejudice.⁶²³

Judge Jackson found that the structural barrier to entry that helped to define the relevant market served also to protect Microsoft's "dominant, persistent, and increasing" market share.⁶²⁴ As a consequence, he found that Microsoft could profitably charge a supracompetitive price for Windows over a significant period without losing an unacceptable amount of business to competitors or, in other words, that "Microsoft enjoy[ed] monopoly power in the relevant market."⁶²⁵ From this finding of monopoly power, and supported by first principles, Judge Jackson concluded that Microsoft *a fortiori* had market power in the tying product market for purposes of per se tying liability.⁶²⁶

D. *The Separate Products Inquiry*

The Supreme Court's *Jefferson Parish* "separate demand" test has generally been regarded as the controlling analysis for the separate products inquiry.⁶²⁷ Judge Jackson used the analysis in his conclusions of law.⁶²⁸ On two other occasions during the *Microsoft* litigation, however, the courts either held or indicated that a different approach was applicable to the tying claim. In his summary judgment opinion, Judge Jackson indicated that he would

substitutes"), *with id.* at 84 ("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.").

622. *Id.* at 81; *see also supra* text accompanying notes 316-24 (reviewing analysis of "browser market" in conclusions of law).

623. *See supra* text accompanying note 384 (describing issue preclusion on remand resulting from plaintiffs' failure to define a relevant Web browser software product market).

624. *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 19, ¶ 36 (D.D.C. 1999).

625. *Id.* at 19, ¶ 33.

626. *See United States v. Microsoft Corp.*, 87 F. Supp. 2d 30, 49 (D.D.C. 2000).

627. *See, e.g.*, *Eastman Kodak Co. v. Image Technical Servs.*, 504 U.S. 451, 462 (1992) (citing *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 21-22 (1984)) ("For service and parts to be considered two distinct products, there must be sufficient consumer demand so that it is efficient for a firm to provide service separately from parts."); *Digidyne Corp. v. Data Gen. Corp.*, 734 F.2d 1336, 1338-39 (9th Cir. 1984) (citing *Jefferson Parish*) (affirming separate products determination where separate demand was undisputed); I ABA SECTION OF ANTITRUST LAW, ANTITRUST LAW DEVELOPMENTS 178 (4th ed. 1997) (stating that *Eastman Kodak* and *Jefferson Parish* "supply the modern framework for antitrust analysis of tying").

628. *See supra* text accompanying note 310.

apply the “facially plausible benefits” standard for product “integration” that the D.C. Circuit had suggested in the predecessor contempt case⁶²⁹ in determining whether Windows 98 was a single product for purposes of per se tying liability.⁶³⁰ On appeal from Judge Jackson’s conclusions of tying liability, however, the D.C. Circuit itself held that the entire per se approach to tying analysis was inapplicable and that instead of using of the separate products inquiry as a “screen” to remove “false positives,”⁶³¹ the trial court should proceed directly to a balancing of anticompetitive effects against procompetitive justifications under the rule of reason.⁶³² This Part revisits each of these approaches in light of our legal conclusions regarding the nature of the tying and tied products in Windows 98 and the markets in which they respectively compete.

1. *Separate Products Under the Jefferson Parish Test*

In *Jefferson Parish*, the plaintiff anesthesiologist challenged a requirement by the defendant hospital that its patients use the hospital’s own anesthesiologists.⁶³³ The hospital argued that the combination of general hospital services with anesthesiologists was not an illegal tying arrangement because it involved “a functionally integrated package of services,” which constituted a single product.⁶³⁴ Rejecting this argument, the Supreme Court held that “the answer to the question whether one or two products are involved turns not on the functional relation between them, but rather on the character of the demand for the two items.”⁶³⁵ An alleged tying arrangement involves two separate products, the Court held, if it “link[s]” two distinct product markets that are “distinguishable in the eyes of buyers.”⁶³⁶ Specifically, there must be 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 services.”⁶³⁷ Even though anesthesiological services would have no functional purpose without other hospital services, the Court noted that it had “often found arrangements involving functionally linked products at least one of which is useless without

629. *United States v. Microsoft Corp.*, 147 F.3d 935, 950-51, ¶ 14 (D.C. Cir. 1998); *see supra* text accompanying notes 166-70.

630. *See supra* text accompanying notes 207-10.

631. *See supra* text accompanying note 349.

632. *See supra* text accompanying note 370.

633. *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 4-7 (1984).

634. *Id.* at 19.

635. *Id.*

636. *Id.* at 19-21.

637. *Id.* at 21-22.

the other to be prohibited tying devices.”⁶³⁸

The Supreme Court subsequently applied the *Jefferson Parish* test in *Eastman Kodak Co. v. Image Technical Services*,⁶³⁹ which concerned a challenge to defendant Kodak’s “policy of selling replacement parts for micrographic and copying machines only to buyers . . . who use Kodak service or repair their own machines.”⁶⁴⁰ Defendant Kodak had moved for summary judgment, arguing, *inter alia*, that service and parts were a single product “because there is no demand for parts separate from service.”⁶⁴¹ The Court held that “[f]or service and parts to be considered two distinct products, there must be sufficient consumer demand so that it is efficient for a firm to provide service separately from parts.”⁶⁴² Finding evidence in the summary judgment record that “service and parts have been sold separately in the past and still are sold separately to self-service equipment owners,”⁶⁴³ the Court concluded that there was a triable issue of fact on the separate products issue. The Court specifically rejected Kodak’s argument that there was no demand for parts without service, reiterating that a tying arrangement between separate products may be found even when one product is useless without the other.⁶⁴⁴

Like *Jefferson Parish* and *Eastman Kodak*, *Microsoft* raises the separate products issue with respect to an alleged tied product (Microsoft’s Web browser software product) that is useless without the alleged tying product (Microsoft’s operating system software product). As shown in Parts IV.B and IV.C, however, the first principles approach supports the identification of two distinct product markets, distinguishable in the eyes of buyers, in which the respective products compete. Judge Jackson, noting that Web browser software products and operating system software products had been sold separately in the past⁶⁴⁵ and continued to be sold separately by all operating system software vendors other than Microsoft,⁶⁴⁶ found that “[b]ecause of the separate demand for browsers and operating systems, firms have found it efficient to

638. *Id.* at 19 n.30.

639. 504 U.S. 451 (1992).

640. *Id.* at 458.

641. *Id.* at 462-63.

642. *See id.* at 462 (citing *Jefferson Parish*, 466 U.S. at 21-22).

643. *Id.* at 462.

644. *Id.* at 463. The apparent existence of “at least some” equipment owners who “purchase parts without service,” and “service without parts,” also factually contradicted Kodak’s argument. *Id.*

645. *See United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 48-51, ¶¶ 153, 156, 165 (D.D.C. 1999).

646. *See id.* at 48, ¶ 153.

supply the products separately.”⁶⁴⁷ Accordingly, the first principles approach supports Judge Jackson’s conclusion that the *Microsoft* tying claim satisfies the *Jefferson Parish* separate products test.⁶⁴⁸

To the extent that a court may still consider it necessary to approach a separate products inquiry involving multifunctional software code by drawing an analogy to a more intuitive setting, the *Jefferson Parish* analysis is particularly informative. In *Jefferson Parish*, the Court identified surgical and anesthesiological services as separate products even though they were provided in the same operating room facilities.⁶⁴⁹ Similarly, the legal rights and technological capabilities that support separately demanded end uses of software code are better understood as the provision of distinct services through some of the same facilities (that is, shared software code libraries), than as the sale of the facilities themselves. In both *Jefferson Parish* and *Microsoft*, the vendor retained legal and technological control over the shared facility through which the distinct services were jointly provided, and continued to have the legal right and technological ability to offer the services separately. In contrast, analogies to multifunctional physical machines such as cars, photocopiers, and cameras⁶⁵⁰ are inapt because such products *themselves* are the facilities through which the various functions are

647. *Id.* As a more general matter, it is rarely the case that two separately demanded software products present “rather obvious economies of joint provision” that would warrant the finding of a single product, given the ease with which different combinations of software products can be distributed through digital rights management and via the Internet. *Jack Walters & Sons Corp. v. Morton Bldg., Inc.*, 737 F.2d 698, 703 (7th Cir. 1984) (*cited in* *United States v. Microsoft Corp.*, 147 F.3d 935, 960 (D.C. Cir. 1998)) (“The practice has been to classify a product as a single product if there are rather obvious economies of joint provision, as in the left-shoe-right-shoe example.”). Compare *id.* with Stephen M. Kramarsky, *Copyright Enforcement in the Internet Age: The Law and Technology of Digital Rights Management*, 11 DEPAUL-LCA J. ART & ENT. L. 1 (2001) (surveying digital rights management technologies) and Randal C. Picker, *Pursuing a Remedy in Microsoft: The Declining Need for Centralized Coordination in a Networked World*, 158 J. INSTITUTIONAL & THEORETICAL ECON. 113 (2002) (explaining that distribution via the Internet reduces the need for mandatory incorporation of software into Windows).

648. See *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30, 50-51 (D.D.C. 2000).

649. See *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 18 & n.27 (1984).

650. See *id.* at 39 (O’Connor, J., concurring) (“Unless it is to be illegal to sell cars with engines or cameras with lenses, this analysis must be guided by some limiting principle.”); *United States v. Microsoft Corp.*, 147 F.3d 935, 950 (D.C. Cir. 1998) (reasoning that the “integrat[ion of] functionalities in a useful way” in software is analogous to the introduction of a self-repairing copier or digital camera).

jointly provided.

2. *Separate Products Under “Facially Plausible Benefits” Test*

In its decision in the contempt case, the D.C. Circuit determined that a product was “integrated” within the meaning of the 1994 consent decree if it “combines functionalities (which may also be marketed separately and operated together) in a way that offers [facially plausible] advantages unavailable if the functionalities are bought separately and combined by the purchaser.”⁶⁵¹ The court’s analysis of what is available to a purchaser who buys and combines functionalities is truncated, however, if such functionalities are deemed to have “no separate existence.”⁶⁵² For example, the software programs that produce two different sets of functionalities do not exist separately if “the code that is required to produce one also produces the other.”⁶⁵³ In such a case, all of the features of one functionality that are supported by the software that supports the other functionality are counted as advantages of the combination.⁶⁵⁴ The defendant then only has to show that these advantages are “facially plausible” in order to prove that the functionalities are a “genuine integration.”⁶⁵⁵

As Judge Jackson observed in his conclusions of law, the Court of Appeals’s departure from *Jefferson Parish* was part of a more general pattern of courts “resist[ing] a strict application of the ‘separate products’ tests to similar questions of ‘technological tying.’”⁶⁵⁶ This resistance reflects the courts’ reluctance to engage “in a technical inquiry into the justifiability of product innovations,”⁶⁵⁷ which often involve the combination of previously separate items.⁶⁵⁸ The D.C. Circuit adopted the “facially plausible benefits” test from a section of the Areeda treatise concerning the proper characterization under tying law of an “integration” of previously unbundled items into a new product design.⁶⁵⁹ In

651. *United States v. Microsoft Corp.*, 147 F.3d at 948.

652. *Id.* at 951-52.

653. *Id.* at 949.

654. *See id.* at 952.

655. *Id.* at 950-52.

656. *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30, 51 (D.D.C. 2000); *see also* *United States v. Microsoft Corp.*, 147 F.3d at 949 (“[T]he courts have recognized the limits of their institutional competence and have on that ground rejected theories of ‘technological tying.’”).

657. *Response of Carolina, Inc. v. Leasco Response, Inc.*, 537 F.2d 1307, 1330 (5th Cir. 1976).

658. *See X AREEDA*, *supra* note 169, ¶ 1746, at 224.

659. *See United States v. Microsoft Corp.*, 147 F.3d at 949-50 (citing *X AREEDA*, *supra* note 169, ¶ 1746b, at 225-29).

Areeda's view, the "facially plausible benefits" test addresses the courts' concern by distinguishing between items that have been "integrate[d] . . . into a new product design"⁶⁶⁰ that warrants judicial deference, and those that have been "merely bolted . . . together."⁶⁶¹

The first principles approach clarifies that the products at issue in the *Microsoft* tying claim are not software programs, but well-defined packages of legal rights and technological capabilities that do have a separate and distinct existence.⁶⁶² Judge Jackson found that Microsoft could have offered these products separately to consumers, who could then buy them separately and combine them.⁶⁶³ With only minor modifications to the accompanying software,⁶⁶⁴ Microsoft could have supplied a version of Windows 98 that legally and technologically supports the use of the Windows 98 software for all purposes excluding Web browsing without "degrad[ing] the performance or stability of Windows 98 in any way."⁶⁶⁵ This would have resulted in a well-functioning market for Web browser software products for Windows 98 in which "users could add a browser of their choice" to fulfill their systems' responsibilities for the purpose of Web browsing.⁶⁶⁶ Microsoft could then have offered the legal rights and technological capabilities to use the Windows 98 software for the purpose of Web browsing "as a service pack upgrade that would locate the relevant software and replace it with the current Windows 98 software."⁶⁶⁷ As the

660. See X AREEDA, *supra* note 169, ¶ 1746b, at 226.

661. See *id.* ¶ 1746b, at 227.

662. See *supra* text accompanying notes 15-27.

663. *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30, 50-51 (D.D.C. 2000).

664. See *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 54-55, ¶¶ 183-85 (D.D.C. 1999). Prof. Felten's program was only a crude prototype developed for the purpose of informing the liability analysis and was not intended as a remedy. See *id.* at 54, ¶¶ 179-82. To the extent that Prof. Felten's minor modifications to the Windows 98 software may be deemed a "drastic alteration of Microsoft's copyrighted work," however, such a change may nevertheless be warranted by the anticompetitive effect of the tie. Compare *New York v. Microsoft Corp.*, 224 F. Supp. 2d 76, 155 (D.D.C. 2002) (permitting alteration of initial boot sequence as remedy where alteration "does not substitute the Windows user interface for a different interface or otherwise drastically alter Microsoft's copyrighted work"), with *United States v. Microsoft Corp.*, 253 F.3d 34, 63 (D.C. Cir. 2001) (concluding that replacing the Windows user interface would amount to a "drastic alteration of Microsoft's copyrighted work" unwarranted by the "marginal anticompetitive effect" of the restraint to be remedied).

665. See *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 54-56, ¶¶ 181, 187, 188.

666. See *id.* at 55, ¶ 187.

667. *Id.* at 55-56, ¶ 188.

resulting combination by the purchaser would be the complete and unaltered Windows 98 product, it would provide all of the advantages that were offered by Microsoft's combination. Judge Jackson summarized this analysis by finding that no consumer benefits, "facially plausible" or otherwise, were attributable to "Microsoft's refusal to offer a version of Windows 95 or Windows 98 without Internet Explorer, or to Microsoft's refusal to provide a method for uninstalling Internet Explorer from Windows 98."⁶⁶⁸

The first principles approach therefore supports the conclusion that Microsoft's Web browser software product and Microsoft's operating system software product are not "integrated" under the D.C. Circuit's test, but are "merely bolted . . . together." Accordingly, if Judge Jackson had proceeded to apply this test to the separate products inquiry, his findings of fact would have supported the conclusion that the tying claim involved separate products. Because he did not,⁶⁶⁹ the "facially plausible benefits" test was never applied to his findings, and only his *Jefferson Parish* analysis was reviewed on appeal.

3. Professor Lessig's Analysis

As pointed out by the court's amicus, Prof. Lawrence Lessig, the separate products inquiry also might have considered whether "the defendant's bundle causes the items to operate together in a way that had not been tried before."⁶⁷⁰ Prof. Lessig suggests that "by choosing to componentize its browser functionality, and thereby expose a larger range of APIs to other applications, Microsoft has caused its browser product to operate with its operating system product in a 'new way.'"⁶⁷¹ Under the first principles approach, however, Microsoft's Web browser software product includes neither the software accompanying Windows 98 nor the legal rights and technological abilities necessary to provide that software as a platform to other applications, and it therefore does not "operate" with Microsoft's operating system software product in any meaningful way to expose APIs.⁶⁷²

4. The D.C. Circuit's Rule-of-Reason Analysis

Under generally applicable tying doctrine, tying arrangements not condemned under the per se rule may still be found to be illegal

668. *Id.* at 55, ¶ 186.

669. *See supra* text accompanying notes 317-22.

670. Lessig, *supra* note 306, at 33 (quoting X AREEDA, *supra* note 169, ¶ 1746, at 224).

671. *Id.* at 37.

672. *See generally* Part IV.A.

under the rule of reason.⁶⁷³ Thus, in holding per se analysis inapplicable to ties of complementary software functionality to platform software, the D.C. Circuit essentially *immunized* this category of tying arrangements from per se tying condemnation.

The Court of Appeals reached this novel holding in two steps.⁶⁷⁴ First, it rejected *Jefferson Parish's* "separate demand" test because it could not account for "innovative and beneficial" features of Windows 98 that could only have been achieved by "requir[ing] non-removal of IE" by the user.⁶⁷⁵ As the existence of such features had not been established at trial, but had only been proffered in Microsoft's appellate briefs,⁶⁷⁶ the D.C. Circuit explicitly avoided implying that Microsoft's inclusion of a Web browser software product in Windows 98 was "desirable," "advantage[ous]," or "welfare-enhancing."⁶⁷⁷ If Microsoft's proffer was correct, however, it would show that the *Jefferson Parish* test was "inadequate to evaluate fully [Microsoft's] potentially innovative technological integration."⁶⁷⁸ Accordingly, the Court of Appeals concluded that Microsoft had posed "a legitimate objection" to the test, warranting its rejection.

Second, the Court of Appeals rejected the per se rule because of a lack of "judicial 'experience'" with the "physical[] and technological[] integrat[ion]" of software,⁶⁷⁹ and because Microsoft's appellate briefs had proffered the existence of benefits to other software vendors from the inclusion of browser-related platform code in the software accompanying Windows 98 that would not be fully accounted for by the rule.⁶⁸⁰ Again, in the absence of supporting findings, the court expressly declined to "pass judgment on Microsoft's claims" regarding such benefits.⁶⁸¹

Both of these departures from settled Supreme Court doctrine⁶⁸²

673. See *supra* text accompanying note 98.

674. See *generally supra* text accompanying notes 344-71 (summarizing opinion).

675. *United States v. Microsoft Corp.*, 253 F.3d 34, 89 (D.C. Cir. 2001).

676. See *id.* ("Microsoft contends not only that its integration of IE into Windows is innovative and beneficial but also that it requires non-removal of IE.").

677. See *id.* at 88-89.

678. *Id.* at 89.

679. See *id.* at 90-91.

680. *Id.* at 90.

681. *Id.*

682. See *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 9 (1984) ("It 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.'"). *But see, e.g., IX AREEDA*, *supra* note 90, ¶ 1701d, at 27-29 (arguing that the *Jefferson Parish* per

were not only facially unsupported, but directly contradicted by the facts proven at trial, as a straightforward application of the “facially plausible benefits” test to Judge Jackson’s findings would have shown.⁶⁸³ Supported by first principles, Judge Jackson had specifically found that there were no “innovative and beneficial” features in Windows 98 attributable to Microsoft’s refusal to permit users to remove its Web browser software product.⁶⁸⁴ The first principles approach also makes clear that the combination of operating system and Web browser software products in Windows 98 does not involve the “physical and technological integration” of software, but the combination of separate packages of legal rights and technological capabilities associated with the same accompanying software code.⁶⁸⁵ Accordingly, Judge Jackson’s tying liability findings do not challenge the inclusion of any platform code, browser-related or otherwise, in the software that accompanies Microsoft’s operating system software product.⁶⁸⁶

The facts proven at trial did not support the D.C. Circuit’s conclusion that *Microsoft* is an exceptional case warranting a departure from settled Supreme Court precedent. Nevertheless, had any of the plaintiffs pursued the tying claim on remand, Judge Jackson’s findings of fact would have been adjudicated under the rule of reason. This analysis would have called for a full review of the anticompetitive effects of, and Microsoft’s proffered justifications for, the conduct challenged under the tying claim.⁶⁸⁷ Part IV of this Article will show that under a first principles approach, Judge Jackson’s findings support tying liability under either a per se or rule of reason analysis. In particular, it will discuss the tying arrangement’s anticompetitive effects and procompetitive justifications in Parts IV.F and IV.G.

In concluding its discussion of the per se rule, the Court of

se rule against tying should be abolished altogether); Hylton & Salinger, *supra* note 24, at 479 (same); Alan J. Meese, *Tying Meets the New Institutional Economics: Farewell to the Chimera of Forcing*, 146 U. PA. L. REV. 1, 3-5 (1997) (same).

683. *See supra* text accompanying notes 662-68.

684. *See supra* note 668 and accompanying text.

685. *See supra* text accompanying notes 530-39.

686. It bears repeating here that Judge Jackson did not identify the commingling of browsing-specific code with operating system routines in Windows 98 as a basis for tying liability. *See supra* text accompanying note 343.

687. *See United States v. Microsoft Corp.*, 253 F.3d 34, 96 (D.C. Cir. 2001) (citations omitted) (“In order for the District Court to conclude these practices . . . constitute § 1 tying violations, plaintiffs must demonstrate that their benefits—if any—are outweighed by the harms in the *tyed product* market.”).

Appeals also expressed the concern that the rule might condemn “the first firm to merge previously distinct functionalities . . . or to eliminate entirely the need for a second function.”⁶⁸⁸ In the context of the *Microsoft* tying claim, this concern relates to Microsoft’s proffered justification that users benefited from the provision of “seamless browsing” between “local and remotely stored information,” which I will also discuss in Part IV.G.⁶⁸⁹

5. *Partial Substitutes?*

According to the Areeda treatise, “a tie of partial substitutes might leverage market power and spread inefficiency from one ‘market’ to another.”⁶⁹⁰ For this reason, the treatise recommends that “[i]tems that are partial substitutes for each other should be deemed separate products.”⁶⁹¹ Microsoft’s operating system and Web browser software products in Windows 98, however, are not partial substitutes for each other—despite suggestions to the contrary in Judge Jackson’s conclusions of law⁶⁹² and Prof. Lessig’s amicus brief⁶⁹³—because each serves a separate and distinct set of user purposes.⁶⁹⁴ The separate products question must therefore be resolved, if at all, by applying one of the other tests as discussed above.

Netscape’s Navigator, on the other hand, is accurately described as a partial substitute for Windows, inasmuch as Navigator supports both the use of its accompanying software as platform software (more specifically, middleware) and the task of performing Web transactions.⁶⁹⁵ Judge Jackson was, therefore, correct in characterizing Navigator both as a potential competitor to Microsoft’s operating systems software product for purposes of the monopoly maintenance analysis⁶⁹⁶ and as a competitor to Microsoft’s Web browser software product for purposes of the tying⁶⁹⁷ and

688. *Id.* at 92.

689. *See infra* text accompanying notes 843-58.

690. X AREEDA, *supra* note 169, ¶ 1747c, at 232.

691. *Id.*

692. *See supra* text accompanying notes 326-29 (discussing Judge Jackson’s concern that “[a] company able to leverage its substantial power in the tying product market in order to force consumers to accept a tie of partial substitutes is thus able to spread inefficiency from one market to the next”).

693. *See* Lessig, *supra* note 306, at 40-42.

694. *See supra* text accompanying note 533.

695. *See Antitrust Analysis, supra* note 28, at 27-28.

696. *See United States v. Microsoft Corp.*, 87 F. Supp. 2d 30, 38-39 (D.D.C. 2000).

697. *See id.* at 49-50.

attempted monopolization⁶⁹⁸ analyses, even though some commentators may have found this characterization to be counterintuitive.⁶⁹⁹ In fact, Netscape's marketing of Navigator could also be described as a tie-in that "link[ed]" two markets that were "distinguishable in the eyes of buyers."⁷⁰⁰ Whether it is an illegal tying arrangement is, of course, another matter entirely.⁷⁰¹

E. Existence of a Tying Condition

To prove per se tying liability, the plaintiff must show that the defendant did not merely enter into an agreement to sell two products together, but "improperly 'conditioned' the sale" of the tying product on the purchase of the tied product.⁷⁰² Such conditioning may be found when there is an express contractual term,⁷⁰³ an announcement,⁷⁰⁴ or other conduct by the seller (also known as an "understood condition")⁷⁰⁵ that leads reasonable buyers to understand that they cannot get the tying product unless they also take the tied product.

When the defendant does not expressly state a tying condition but merely offers two products in a bundle, at most it is only possible to infer an understood tying condition. For an understood condition to be inferred, according to the Areeda treatise, the plaintiff must prove either that the defendant rebuffed requests for separate provision or that "circumstances indicate that customers reasonably believed that such requests would be futile or excessively burdensome."⁷⁰⁶ For example, where a defendant packages products together in a box, "no reasonable retail consumer believes he can cause the manufacturer to take seriously a request for altering the contents of the box."⁷⁰⁷ Thus, the practice of packaging products in a

698. *See id.* at 45-46.

699. *See, e.g.,* Brennan, *supra* note 332, at 1075-77 (describing this characterization as a "tension" in Judge Jackson's conclusions of law); Economides, *supra* note 26, at 30 (describing it as a "major contradiction").

700. *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 19-21 (1984).

701. While Netscape's Web browser software product (the tying product) arguably enjoyed a monopoly in 1994 and 1995, *see United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 29, ¶ 72 (D.D.C. 1999), it is hard to imagine that the tie-in could have resulted in any foreclosure in the tied product market, since it did not prevent any other vendors from distributing software code to be preinstalled as platform software. In contrast, the Microsoft tying arrangement did result in foreclosure in the tied product market. *See infra* Part IV.F.

702. *See X AREEDA*, *supra* note 169, ¶ 1752b, at 280-81.

703. *See id.* ¶ 1753, at 292-300.

704. *See id.* ¶ 1754b, at 301-03.

705. *See id.* ¶ 1754c, at 303-05.

706. *Id.* ¶ 1756e, at 325 (citations omitted).

707. *Id.* ¶ 1756e, at 326.

box for consumer sale is generally regarded as a tie of the products.⁷⁰⁸ Similarly, according to Areeda, a form contract covering two products should be presumed to be a tie if the plaintiff also presents evidence that “buyers requested separate provision and were rebuffed or that many buyers actually understood that they had to buy [the tied product] in order to get the defendant’s [tying product].”⁷⁰⁹

Viewed in light of first principles, Microsoft’s inclusion of a Web browser software product in Windows 98 involved at least four specific acts from which a court could properly infer an understood condition tying the legal rights and technological capabilities that constitute a Web browser software product to those that constitute an operating system software product.

First, Microsoft offered Windows 98 to end users only under form license agreements that granted sufficient legal rights to install and run the Windows 98 software on a system according to the documentation for both operating system and Web browsing purposes.⁷¹⁰

Second, Microsoft refused to allow its OEM licensee-distributors to alter the Windows 98 software or remove the desktop icons that are the principal documented means by which end users of Windows 98 can obtain technological access to Microsoft’s Web browser software product.⁷¹¹ Microsoft implemented these restrictions over “strident opposition from its OEM customers,” who were forced to “obey[] the restrictions because they perceived no alternative to licensing Windows for pre-installation on their PCs.”⁷¹² As a result, the operating system and Web browser software products in Windows 98 were always bundled together when they were offered to consumers.

Third, Microsoft excluded its Web browser software product from the Add/Remove Programs facility that is the principal documented means by which end users of Windows 98 can remove

708. *See id.* ¶ 1756e, at 325-26 (citing *Data Gen. Corp. Antitrust Litig.*, 490 F. Supp. 1089, 1110-11 (N.D. Cal. 1980)).

709. *Id.* ¶ 1756d1, at 322-23. Areeda suggests that the proposed presumption should be rebuttable by proof that buyers frequently requested and received the tying product separately or generally understood that contract revisions were readily available.

710. *See* End User License Agreement for Microsoft Windows 98, *supra* note 535; *see also* *United States v. Microsoft Corp.*, 253 F.3d 34, 84 (D.C. Cir. 2001) (restating district court finding that “Microsoft required licensees of Windows 95 and 98 also to license IE as a bundle at a single price”).

711. *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 61, ¶ 213 (D.D.C. 1999).

712. *Id.* at 62, ¶ 215.

technological access to software products.⁷¹³ In fact, Microsoft rebuffed specific requests from an OEM to “provide a way to uninstall Internet Explorer 4.0 from Windows 98.”⁷¹⁴ Because of this, retail consumers were unable to obtain the operating system software product in Windows 98 separately by first obtaining Windows 98 and then discarding Microsoft’s Web browser software product.

Finally, when a retail consumer chooses to use a non-Microsoft Web browser software product as the default, “Windows 98 nevertheless requires the user to employ Internet Explorer in numerous situations that, from the user’s perspective, are entirely unexpected.”⁷¹⁵ In these situations, the user was required to exercise the necessary legal rights and utilize the necessary technological access to run the Windows 98 code for the purpose of Web browsing. Consequently, retail consumers were unable to obtain the operating system software product in Windows 98 separately by first obtaining Windows 98 and then declining to use Microsoft’s Web browser software product.

Judge Jackson’s findings that Microsoft rebuffed OEM requests for separate provision are sufficient to support an inference of an understood tying condition with respect to OEM licensees. Moreover, since the Windows 98 software product is delivered to the retail consumer by “shrinkwrapping” or “clickwrapping” a copy of the software with the form license agreement, no reasonable retail consumer believed he could cause Microsoft to take seriously a request for altering the contents of the box to permit the separate provision of either legal rights or technological capabilities. Microsoft’s conduct therefore also supports an inference of an understood tying condition with respect to end user licensees.

1. Commingling of Code

As previously noted, the commingling of browsing-specific code with operating system files in the software accompanying Windows 98 created a barrier to entry into the market for Web browser software products for Windows 98 by restricting the memory available to rival software,⁷¹⁶ and was accordingly recognized as a basis for section 2 liability.⁷¹⁷ Because software products do not

713. *See id.* at 52, ¶ 170.

714. *Id.*; *see also supra* note 229 and accompanying text (citing similar proposed findings by the government).

715. *See United States v. Microsoft Corp.*, 84 F. Supp. 2d at 52, ¶ 171.

716. *See supra* text accompanying notes 605-07.

717. *See supra* text accompanying note 392.

include their accompanying software,⁷¹⁸ however, the commingling of code did not serve to combine Microsoft's operating system and Web browser software products. As Prof. Felten's prototype removal program showed, whether or not a consumer has been forced to take a Web browser software product does not depend on whether browsing-specific code is present on the computer's hard drive.⁷¹⁹ The first principles approach therefore supports Judge Jackson's decision not to identify the commingling of code as a basis for section 1 tying liability.⁷²⁰

2. "Technological Tying" and Product Interdependence

A tying condition that has been implemented at least in part through technological means may be referred to as a "technological tie." Bundling the tying and tied products together physically (for example, by bolting them together or placing them into the same box) would constitute a technological tie in this sense.⁷²¹ The term "technological tie" is sometimes used more narrowly,⁷²² however, to describe a situation where "a defendant has market power in a primary product that works better with his complementary product than with rival versions"; that is, where there is "product interdependence."⁷²³ Because this product interdependence may be the result of procompetitive innovation, some courts have been reluctant to find a tying condition in such cases.⁷²⁴

718. See *Antitrust Analysis*, *supra* note 28, at 26.

719. See *supra* text accompanying notes 561-69.

720. See *supra* note 312. A leading treatise suggests that code commingling was not found to be a predicate act for the tying claim because it was a "purely unilateral act" rather than a "contract, combination, or conspiracy" as required by § 1. HOVENKAMP ET AL., *supra* note 88, § 21.8a, at 21-137 n.11. This reasoning, however, does not account for the district court's conclusions of tying liability for the unilateral acts of excluding Internet Explorer from the Add/Remove facility and overriding the user's choice of a default Web browser. See *supra* text accompanying notes 713-15.

721. See HOVENKAMP ET AL., *supra* note 88, § 21.5b2, at 21-104; see also X AREEDA, *supra* note 169, ¶ 1757a, at 335 n.2 (noting that the term is sometimes used "to include the combination of two items in one device"); *United States v. Microsoft Corp.*, 147 F.3d 935, 948-49 (D.C. Cir. 1998).

722. See X AREEDA, *supra* note 169, ¶ 1757a, at 335 n.2 (distinguishing between the two usages of the term). *But see* HOVENKAMP ET AL., *supra* note 88, § 21.5b2, at 21-104 (not distinguishing between the two usages).

723. X AREEDA, *supra* note 169, ¶ 1757a, at 335-36. The concept of product "integration" is even narrower than that of "product interdependence," as the defendant must show that the challenged combination works better when bundled by the defendant than when the products are obtained separately and combined by the purchaser. See *supra* text accompanying note 154.

724. See, e.g., *Foremost Pro Color, Inc. v. Eastman Kodak Co.*, 703 F.2d 534, 542 (9th Cir. 1983) ("[W]e decline to place . . . technological ties in the category

In light of first principles, the inclusion of Microsoft's Web browser software product in Windows 98 was a technological tie in the first sense but not the second. Microsoft implemented the understood tying condition in part through technological methods that had the effect of excluding Internet Explorer from the Add/Remove facility and overriding the user's choice of a default Web browser. There is, however, no technological interdependence between the tying and tied products. As Prof. Felten demonstrated, it is reasonably practicable for Microsoft to remove its Web browser software product so as to leave Windows 98 capable of supporting all purposes excluding Web browsing without "degrad[ing] the performance or stability of Windows 98 in any way."⁷²⁵ Because Microsoft's operating system software product does not work any better with Microsoft's Web browser software product than with other Web browser software products, the *Microsoft* tying claim does not represent a challenge to the kind of innovation that results in product interdependence.

F. Dollar-Volume Foreclosure and Anticompetitive Effect in the Tied Product Market

For a tying arrangement to be per se illegal, it must affect "a 'not insubstantial' amount of interstate commerce" in the tied product.⁷²⁶ While this requirement calls for a showing as to the dollar-volume of affected business, the dollar-volume need only be "substantial enough . . . so as not to be merely *de minimis*."⁷²⁷ In this context, the Supreme Court has held that as little as \$60,800 was not insubstantial.⁷²⁸

Some doctrinal approaches to tying call for a closer examination of the actual and potential anticompetitive effects of the challenged conduct. For example, even though the per se analysis of a tying claim does not permit a detailed measurement of market

of economic restrictions deemed *per se* unlawful by *Northern Pacific* and its progeny."); see also *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30, 51 (D.D.C. 2000) (noting that other courts "resist a strict application of the 'separate products' tests to similar questions of 'technological tying'"); X AREEDA, *supra* note 169, ¶ 1757, at 335-41 (arguing that most product interdependence is procompetitive and should raise a presumption of no tying condition).

725. *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 54, ¶ 181 (D.D.C. 1999); see also *supra* text accompanying notes 295-98 (explaining why Prof. Felten's program effectively removes the Web browser software product).

726. *N. Pac. Ry. v. United States*, 356 U.S. 1, 11 (1958).

727. *Fortner Enters. v. U.S. Steel Corp.*, 394 U.S. 495, 501 (1969).

728. *United States v. Loew's, Inc.*, 371 U.S. 38, 49 (1962).

foreclosure,⁷²⁹ the Supreme Court has stated that “as a threshold matter there must be a substantial potential for impact on competition in order to justify per se condemnation.”⁷³⁰ For per se liability to be appropriate, then, the challenged conduct must be shown to be “of the type that could cause the kind of foreclosure that anti-tying rules seek to prevent.”⁷³¹ Accordingly, lower courts that include “anticompetitive effects” as an element of per se tying liability have not undertaken detailed measurements of market foreclosure, but instead have used the requirement to excuse certain types of tying arrangements that do not present the potential for a substantial anticompetitive effect in the tied product market.⁷³²

In their proposed conclusions of law, the *Microsoft* plaintiffs argued that the tying arrangement’s “significant adverse effect on Netscape’s browser business” was sufficient to satisfy the dollar-volume requirement for per se tying liability.⁷³³ Judge Jackson agreed, concluding that Microsoft’s refusal to offer Internet Explorer separately from Windows had caused Netscape Navigator’s usage share to drop substantially from 1995 to 1998, and that “as a direct result Netscape suffered a severe drop in revenues from lost advertisers, Web traffic and purchases of server products” numbering in the millions of “units.”⁷³⁴ Even without a precise finding as to the dollar-volume of the affected business in the tied product, Judge Jackson found it “obvious” that the effect of the challenged tie had exceeded the *de minimis* threshold.⁷³⁵

The *Microsoft* plaintiffs argued in the alternative that Microsoft’s tying conduct also be condemned under the rule of reason, but did not support this contention by identifying any actual or potential anticompetitive effects in the putatively tied product market.⁷³⁶ Instead, the government stated that Microsoft’s tying conduct “imposed extra costs on OEMs and consumers, harmed

729. *See, e.g.*, *Ohio-Sealy Mattress Mfg. v. Sealy Inc.*, 585 F.2d 821, 835 (7th Cir. 1978) (“Because the Supreme Court has repeatedly held that tying, if it fits within the *Northern Pacific* standard, is a *per se* violation, we are not free to inquire whether such tying in any given case injures market competition. . . . [H]owever . . . if a given tying arrangement has no potential to foreclose access to the tied product market, it does not exemplify the vice that led the [Supreme] Court to declare tying a *per se* offense.”).

730. *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 16 (1984).

731. IX AREEDA, *supra* note 90, ¶ 1722, at 286.

732. *See id.* ¶ 1722c, at 291.

733. Pls.’ Proposed Conclusions of Law, *supra* note 330, at 60.

734. *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30, 49-50 & n.5 (D.D.C. 2000).

735. *Id.* at 49-50.

736. *See* Pls.’ Proposed Conclusions of Law, *supra* note 330, at 61-62.

consumers by delaying the release of Windows 98, and otherwise denied many consumers benefits that they desired and that there was no sound economic reason to deny them.”⁷³⁷ Judge Jackson, having found Microsoft liable under a per se theory, did not examine the tying claim under the rule of reason standard or identify any actual or potential anticompetitive effects in the “browser market” that would support liability under that standard.⁷³⁸ Thus, neither the *Microsoft* plaintiffs’ nor Judge Jackson’s legal analyses addressed the Supreme Court’s “threshold” requirement of “a substantial potential for impact on competition” in the tied product market for application of the per se rule⁷³⁹ or Microsoft’s specific contention that there was no foreclosure in the alleged tied product market,⁷⁴⁰ let alone the requirement of an “actual effect . . . on competition” for liability under the rule of reason doctrine that was eventually adopted by the D.C. Circuit for ties between platform and application software products.⁷⁴¹

These omissions were unnecessary. Given our precise characterizations of the *Microsoft* tying arrangement and the tied product market,⁷⁴² it is a straightforward matter to conduct a detailed assessment of foreclosure that addresses both the per se and rule of reason standards for liability.

1. “Price Bundling”

Because the purpose of the present analysis is to derive legal conclusions from Judge Jackson’s findings of fact, we adopt that opinion’s finding that Microsoft did not charge a price increment for the inclusion of Internet Explorer in Windows 98.⁷⁴³ Accordingly, despite the D.C. Circuit’s suggestion to the contrary,⁷⁴⁴ there is no need here to consider “price bundling” as a distinct basis for tying liability in *Microsoft*.

2. Bundling of Consumers’ Legal Rights

In a tie of two software products, the legal rights and technological capabilities that comprise the tying product are available only in combination with the legal rights and technological capabilities that comprise the tied product. Microsoft’s form end

737. *Id.* at 62.

738. *United States v. Microsoft Corp.*, 87 F. Supp. 2d at 49-50.

739. *See supra* text accompanying note 730.

740. *See supra* text accompanying note 276.

741. *United States v. Microsoft Corp.*, 253 F.3d 34, 95 (D.C. Cir. 2001).

742. *See supra* text accompanying notes 601-03, 710-15.

743. *See United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 44, ¶ 137 (D.D.C. 1999).

744. *See United States v. Microsoft Corp.*, 253 F.3d at 96-97.

user license agreements ensured that consumers could obtain the legal rights associated with Microsoft's operating system software product in Windows 98 only in combination with the legal rights associated with Microsoft's Web browser software product.⁷⁴⁵ The other challenged acts then effectively completed the tie by preventing consumers from obtaining technological access to Microsoft's operating system software product in Windows 98 without also obtaining technological access to Microsoft's Web browser software product.

3. *Restrictions on OEM Licensee-Distributors*

Microsoft's prohibitions against certain alterations of Windows 98 by its OEM licensee-distributors fall into the general category of dealer tie-ins, which have sometimes been exempted from per se treatment in cases where it appeared that the resulting displacement of competing suppliers was intrinsically small.

For example, in *Smith Machinery Co. v. Hesston Corp.*,⁷⁴⁶ the plaintiff dealer Smith alleged that the manufacturer Hesston would allow him to carry Hesston's hay and forage machines only if he also agreed to carry Hesston's tractors. Smith argued that due to his financial constraints, every forced purchase of a Hesston tractor foreclosed the purchase of a John Deere tractor. The district court granted summary judgment, concluding that even if Smith's argument were true, the foreclosure was too small in the context of the consumer market for tractors.⁷⁴⁷ In affirming, the Tenth Circuit noted that Deere was not foreclosed because

[Deere] had the market power and resources to distribute its products through a different outlet—either through another local dealer or by vertically integrating itself. Or, as actually happened here, Smith could choose to continue selling only Deere tractors and assume the risk that Hesston would take its product line to a dealer willing to carry and sell its entire line. This is precisely the type of competitive behavior the Sherman Act was designed to encourage.⁷⁴⁸

Because "the line forcing imposed by Hesston was being used as a tool to compete, and not to restrain competition," Hesston could not be held liable under a per se theory of tying.⁷⁴⁹

In *Fox Motors, Inc. v. Mazda Distributors (Gulf), Inc.*,⁷⁵⁰ a

745. See *supra* note 710 and accompanying text.

746. 878 F.2d 1290, 1291 (10th Cir. 1989).

747. *Id.* at 1292.

748. *Id.* at 1296-97.

749. *Id.* at 1297.

750. 806 F.2d 953 (10th Cir. 1986).

number of car dealers challenged Mazda's practice of allocating its popular RX-7 sports car in proportion to sales of its less popular GLC model.⁷⁵¹ Some of the dealers were "dual dealers" who distributed multiple lines of cars. The dual dealers that testified never claimed that Mazda's allocation system had precluded them from buying other lines of vehicles to compete with the GLC.⁷⁵² Despite this, the district court instructed the jury to decide the question of tying liability under a per se theory.⁷⁵³ The Tenth Circuit reversed, concluding that "consumers made their choices free of any tie" and the allocation system did not foreclose manufacturers of cars competitive with the GLC.⁷⁵⁴

From these and similar decisions, the Areeda treatise concludes that a court may determine that the foreclosure resulting from a dealer tie-in is "too intrinsically minor to trigger per se condemnation"⁷⁵⁵ in three situations: (1) where the dealer "is contractually free and practically able to resell at least some other brand,"⁷⁵⁶ (2) where the dealer's role in choosing the tied product to be distributed to consumers is limited because consumers tend to "aggressively . . . shop around among brands and among dealers for the allegedly tied product,"⁷⁵⁷ and (3) where the plaintiffs have incorrectly drawn a narrow market for the tying product so as to understate the ability of rival suppliers to reach consumers.⁷⁵⁸ In such cases, the tie-in may be characterized as a "potentially pro-competitive line force that should not be condemned per se."⁷⁵⁹

First principles and Judge Jackson's findings of fact do not provide a basis for excluding the dealer tie-in in *Microsoft* from per se treatment under any of the Areeda criteria. First, even though the prohibitions against altering Windows 98 did not contractually restrain OEMs from distributing other Web browser software products in addition to Microsoft's, Judge Jackson found that their practical ability to do so was greatly constrained by the additional support and testing costs associated with installing a second application in a given software category.⁷⁶⁰ Second, Judge Jackson

751. *See id.* at 958.

752. *Id.*

753. *Id.* at 956.

754. *Id.* at 958.

755. IX AREEDA, *supra* note 90, ¶ 1725a, at 316.

756. *Id.* ¶ 1725d, at 323.

757. *Id.* ¶ 1725d, at 324.

758. *Id.* ¶ 1725d, at 324-25.

759. *Id.* ¶ 1725d, at 323.

760. *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 49-50, ¶ 159 (D.D.C. 1999) (describing support and testing costs); *id.* at 68, ¶ 239 (finding that Microsoft's actions had "largely succeeded in exiling Navigator from the crucial

also found that an OEM's preinstallation of a Web browser software product on its PCs had the practical effect of determining the software product that many, if not most, consumers of those PCs would use to perform Web transactions.⁷⁶¹ As a result, he found that the distribution of Microsoft's Web browser software product in accordance with the OEM restrictions—"prominent placement on the Windows desktop"—foreclosed "one of the two distribution channels that leads most efficiently to the usage of browsing software,"⁷⁶² and contributed to Microsoft's success in "wean[ing] . . . a large amount of usage share from Navigator."⁷⁶³ Finally, the OEM restrictions have been characterized as a tying condition by reference to rigorously defined tying and tied product markets based on first principles, not merely the plaintiffs' representations.⁷⁶⁴

4. *Restrictions on Consumers*

By overriding the choice of a non-Microsoft default browser in "numerous . . . entirely unexpected" situations⁷⁶⁵ and by refusing to provide consumers with a documented method of preventing this overriding (for example, by uninstalling Internet Explorer via the Add/Remove panel),⁷⁶⁶ Microsoft effectively forced all consumers of its operating system software product in Windows 98 to take and use its Web browser software product to support the user purpose of performing Web transactions in at least a small fraction of instances. Moreover, Judge Jackson found that this requirement was significant enough to cause consumers "considerable uncertainty and confusion in the ordinary course of using Windows 98" with a non-Microsoft Web browser software product.⁷⁶⁷

At first glance, the forced usage of Microsoft's Web browser software product may appear to fall into the category of "fractional ties," in which "a defendant with the requisite degree of power over tying product A sells it only to those who purchase [a small specified

OEM distribution channel").

761. *Id.* at 46-47, ¶¶ 144-45 (citing Microsoft's studies showing that "a very large majority of those who browse the Web obtain their browsing software with either their PCs or their [Internet access] subscriptions," and explaining that other software products are less likely to be used because they "require users to expend effort before they can start browsing"); *cf.* IX AREEDA, *supra* note 90, ¶ 1725d, at 324 (citing "[d]ealer-installed [car] accessories" as an example of a case where consumers do not seem to shop aggressively among brands).

762. *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 69, ¶ 241.

763. *Id.* at 102-03, ¶ 376.

764. *See supra* Part IV.E.

765. *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 52, ¶ 171.

766. *See id.* at 52, ¶ 170.

767. *Id.* at 52, ¶ 171.

percentage] of their *B* requirements from him.”⁷⁶⁸ There do not appear to be any judicial precedents analyzing the effects of a fractional tie on competition in the tied product market, but the Areeda treatise discusses such effects at some length.⁷⁶⁹ According to the treatise, fractional ties that can effectively foreclose only an intrinsically small percentage of the tied product market should not be subject to per se condemnation, because such ties “would seldom accomplish any of the functions of a tie-in.”⁷⁷⁰ The treatise goes on to explain, however, that not every small-percentage fractional tie inherently results in a small foreclosure in the tied market:

[A] fractional tie will foreclose more than the specified fraction when the tied customer cannot practicably utilize a second source, though contractually free to do so. For example, suppose that the seller of machine *A* requires customers to perform 5 percent of their *B* operations on a *B* machine from the defendant. If that machine can actually perform 100 percent of the customer’s *B* operations, the customer would hardly purchase a second *B* machine from a rival supplier. Or a customer using product *B* from the defendant might increase his costs if he also used a differently configured product *B*. In such circumstances, requiring a customer to purchase a fraction of his *B* needs deprives rivals of all the tied customer’s patronage.⁷⁷¹

The treatise concludes that if fractional ties are to be exempted from per se condemnation, then it is appropriate for a tie to “cease to be classified as fractional once it appears that the fraction [of required purchases] understates the degree of foreclosure.”⁷⁷²

Judge Jackson’s findings show that Windows 98 users were not contractually restrained from using a second Web browser software product,⁷⁷³ but many found it impracticable to do so. Since all existing software products that are marketed as Web browsers, including Microsoft’s, are designed to support one hundred percent of consumers’ Web transactions,⁷⁷⁴ “once [consumers] have acquired,

768. IX AREEDA, *supra* note 90, ¶ 1725i, at 329-30.

769. *See id.*

770. *Id.* ¶ 1725i, at 329 & n.48.

771. *Id.* ¶ 1725i, at 329-30.

772. *Id.* ¶ 1725i, at 330.

773. *United States v. Microsoft Corp.*, 87 F. Supp. 2d 30, 53 (D.D.C. 2000) (concluding that Microsoft’s exclusive dealing contracts “did not ultimately deprive Netscape of the ability to have access to every PC user worldwide to offer an opportunity to install Navigator. Navigator can be downloaded from the Internet. It is available through myriad retail channels. It can (and has been) mailed directly to an unlimited number of households.”).

774. *See supra* text accompanying notes 590-91 (concluding that all existing software products that are marketed as Web browsers are reasonably

found, and used one browser product, most are reluctant—and indeed have little reason—to expend the effort to switch to another.”⁷⁷⁵ Moreover, Microsoft’s overriding of the Web browser software product ensured that the use of a second Web browser software product would result in “considerable uncertainty and confusion in the ordinary course of using Windows 98” and “a jolting experience,” which “directly disinclined Windows 98 consumers to use” a second Web browser software product.⁷⁷⁶ Also, inasmuch as “standardizing” on a single browser “lower[s] training and support costs, and permits the establishment of consistent security and privacy policies governing Web access,”⁷⁷⁷ the use of a second Web browser software product was likely to increase the consumer’s total costs.

Judge Jackson’s findings, viewed in light of first principles, therefore support the conclusion that the fraction of Web transactions in which consumers were required to use Microsoft’s Web browser software product understated the degree of foreclosure in the tied product market. Accordingly, the Areeda analysis counsels that the consumer restrictions “cease to be classified as fractional” for purposes of determining the applicability of per se tying liability.

The first principles approach also supports an alternative description of the foreclosure in the tied product market. In a well-functioning software product market, each vendor is able to specify the software that is to be executed when a consumer chooses to use its software product for its intended purpose—here, performing Web transactions—and to offer a software product that confers sufficient legal rights and technological capabilities to enable the consumer to run such software.⁷⁷⁸ In such a market, a consumer could choose a single product to support the task of performing Web transactions

interchangeable for the purpose of performing Web transactions); *see also supra* text accompanying notes 587-89 (explaining that any restrictions on “a software product’s support for performing Web transactions” are material to the reasonable interchangeability inquiry). Since multiple instances of browser software can be loaded into memory and executed, *see Antitrust Analysis, supra* note 28, at 68, in theory a single installation of a Web browser software product can support an unlimited number of simultaneous Web transactions. To the extent that consumers in practice are constrained in the quantity of Web transactions they can perform, typically this is due to limitations on bandwidth, memory, and processor speed.

775. *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 46-47, ¶ 144 (D.D.C. 1999).

776. *Id.* at 52-53, ¶¶ 171-72.

777. *Id.* at 48, ¶ 151.

778. *See Antitrust Analysis, supra* note 28, at 40.

on the basis of search costs, communication costs, security and privacy risks, and the accuracy of information presented about the values of transaction choices,⁷⁷⁹ without also having to consider the inconvenience of having that choice overridden.

Microsoft's consumer restrictions prevented other vendors from offering such a product to *any* consumers. In other words, regardless of the manner in which Microsoft's rivals in the tied product market designed and implemented their software products to support the task of performing Web transactions, Microsoft's overriding would still prevent the rivals' products from meeting the user's intentions in some unexpected situations.⁷⁸⁰ This particular failure to perform adversely affects the performance metrics of all Web browser software products except Microsoft's. Inasmuch as consumers are, as a result, "directly disinclined" to use rival products, these effects materially differentiate rival products from Microsoft's Web browser software product with respect to one or more relevant competitive variables for purposes of the reasonable interchangeability inquiry.⁷⁸¹ Despite this competitive disadvantage, Microsoft's rivals are not necessarily foreclosed from the market in which Microsoft's Web browser software product competes; they might still be able to offer products reasonably interchangeable with Microsoft's Web browser software product by providing offsetting advantages with respect to other competitive variables. Because no rival is certain to overcome the disadvantage resulting from Microsoft's consumer restrictions,⁷⁸² however, we may conclude that those restrictions have the potential to cause a positive and not intrinsically small foreclosure in the tied product market.

779. See *supra* note 586 and accompanying text. Judge Jackson found that Internet Explorer's frequent "security and privacy vulnerabilities" demonstrate the need for ongoing competition with respect to these performance variables. *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 58, ¶ 198 ("[T]here is no indication that Microsoft is destined to provide a 'best of breed' Web browser that makes continuing, competitively driven innovations unproductive.").

780. Cf. CEM KANER & DAVID PELS, *BAD SOFTWARE: WHAT TO DO WHEN SOFTWARE FAILS* 68 (1998) ("We regard a program as defective if it fails to provide the benefits promised by the publisher or if it imposes unnecessary costs on you when you try to use it for its intended purpose.").

781. See *Antitrust Analysis*, *supra* note 28, at 33-34.

782. See *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 103-04, ¶ 379 (finding that Netscape, unable "to pay for the inefficient modes of distribution to which Microsoft had consigned it," was "deterred . . . from undertaking technical innovations that it might otherwise have implemented in Navigator"). Significantly, this disadvantage was not specific to Netscape, but would have affected any existing or potential vendor of a Web browser software product for Windows 98.

5. *Relevance of Foreclosure to Anticompetitive Effects*

In some cases, even a significant foreclosure may be deemed irrelevant to the threshold requirement of anticompetitive effects in the tied product market. Where the defendant lacks an economic interest in the tied product, a tying arrangement “does not ordinarily enhance the defendant’s power in the tied market or bring about any other consequences of the kind that the per se rule against tying seeks to prevent.”⁷⁸³ In such cases, most courts that include anticompetitive effects as an element of per se tying liability have concluded that the tying arrangement does not raise a substantial potential for impact on competition.⁷⁸⁴ A defendant may lack an economic interest in the tied product, for example, where the defendant sells the tying product only to those agreeing to purchase the tied product from some third party in whom the defendant has no financial interest.⁷⁸⁵

Even though consumers received Microsoft’s Web browser software product for no additional charge,⁷⁸⁶ Judge Jackson specifically found that “all browser vendors, including Microsoft, have significant economic interests in maximizing usage of the browsing functionality they control.”⁷⁸⁷ For example, by using bookmarks and other aspects of the user interface to promote particular Web sites and services, popular browser vendors can earn ancillary revenues from paid advertisers.⁷⁸⁸ Also, by supporting Web resources that conform to a particular standard, browser vendors can promote other software products that use that standard and in which they have an economic interest.⁷⁸⁹ Because Microsoft’s tying conduct resulted in a not intrinsically small foreclosure of the market for a tied product in which Microsoft had an economic interest, the tying claim satisfies the threshold requirement of “a

783. IX AREEDA, *supra* note 90, ¶ 1726a, at 331.

784. *See id.* ¶ 1726c, at 334-35 & nn.7-18 (citing cases).

785. *See id.*

786. *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 44, ¶ 137.

787. *Id.* at 58, ¶ 201.

788. *See id.* at 46, ¶ 142.

789. *Id.* at 104, ¶ 383 (noting “Microsoft’s increasing influence over network-centric standards” as a result of its growing share of the market for Web browser software products); *id.* at 33, ¶ 89 (finding that if Microsoft had taken Netscape’s market share in 1995, Microsoft would have gained “control over the extensions and standards that network-centric applications (including Web sites) employ”); *id.* at 84, ¶ 299 (“AOL was interested in keeping Navigator alive in order to ensure that Microsoft did not gain total control over Internet standards.”); *id.* at 103, ¶ 377 (citing a February 1998 Microsoft memorandum that describes the company’s “mission . . . to not let [N]etscape dictate standards”).

substantial potential for impact on competition” in the tied product market for purposes of per se condemnation.⁷⁹⁰

6. *Measuring Foreclosure*

A rule-of-reason analysis of the *Microsoft* tying claim on remand would have required a detailed measurement of foreclosure in the tied product market. Because the vast majority of tying claims are resolved through a per se tying analysis, there does not appear to be any precedent in the case law for measuring the particular kinds of foreclosure that resulted from Microsoft’s tying conduct.⁷⁹¹ We again consult the Areeda treatise for guidance.

Five of the treatise’s recommendations are applicable to Microsoft’s tying conduct. First, as a general matter, “[a]ll of a defendant’s tied-product sales covered by tying arrangements should be deemed foreclosed” for purposes of testing reasonableness.⁷⁹² Second, where the existence of a tying condition is inferred from “the defendant’s clearly proved coercion of particular customers,” it is reasonable to assume that the resulting foreclosure extends also to similarly situated customers absent evidence to the contrary.⁷⁹³ Third, tied sales to dealers should be counted as foreclosed to the same extent as tied sales to consumers,⁷⁹⁴ even where they are attributable to a potentially competitive full-line force and would not be “deemed foreclosed for purposes of the per se rule.”⁷⁹⁵ Fourth, fractional ties may be deemed to result in foreclosure, but only where “technical or economic factors prevent a purchaser from patronizing a second source for the tied product.”⁷⁹⁶ Finally, where tying has long been practiced in a market, “[t]he appearance of a monopoly after large-foreclosure tying may be attributed presumptively to the tie.”⁷⁹⁷

The existence of a dealer tie-in was inferred from evidence that two OEMs were coerced⁷⁹⁸ and that all other OEMs were similarly situated to them insofar as they reasonably “perceived no alternative” to obeying Microsoft’s restrictions.⁷⁹⁹ The foreclosure attributed to Microsoft’s dealer tie-in should therefore include all

790. *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 16 (1984).

791. Per se analysis of a tying claim does not permit a detailed measurement of market foreclosure. *See supra* note 729 and accompanying text.

792. IX AREEDA, *supra* note 90, ¶ 1729h.1, at 398.

793. *Id.* ¶ 1729h.3, at 399.

794. *Id.* ¶ 1729h.7, at 399.

795. *Id.* ¶ 1729h.10 & n.82, at 400.

796. *Id.* ¶ 1729h.2 n.71, at 398.

797. *Id.* ¶ 1729d, at 382.

798. *See supra* note 229 and accompanying text.

799. *See supra* text accompanying note 712.

units of Microsoft's Web browser software product that were distributed with Windows 98, and subsequent versions of Windows, by OEMs by the time of the remand proceedings. With respect to Microsoft's consumer tie-in, the measurement of foreclosure under the rule of reason on remand would require a determination of the extent to which "technical or economic factors" deterred consumers from using a second Web browser software product.⁸⁰⁰

By the time of the remand proceedings, an overwhelming majority of Web transactions were being supported by Microsoft's Web browser software product for Windows 98 or its successors (that is, units covered by the dealer tie-in),⁸⁰¹ and Windows 98's predecessors had largely been retired from use.⁸⁰² Moreover, Microsoft's continuing practice of overriding the ability of competitors to support Web transactions had presented a significant and durable impediment to quality (and hence quality-adjusted price) competition in the market for Web browser software products for Windows 98.⁸⁰³ Thus, the structure and performance of the tied market indicated that Microsoft had succeeded in establishing a monopoly in that market.

The appearance of this monopoly may be presumptively attributed to Microsoft's tying conduct, which included not only the large-foreclosure dealer tie-in but also a significant consumer tie-in. In rebuttal, Microsoft might have argued that its increased market share was the result either of improvements in the quality of its Web browser software product⁸⁰⁴ or of network externalities that "tipped" the browser competition into a "winner-take-most"

800. Even though these factors supported the conclusion that Microsoft's consumer tie-in should "cease to be classified as fractional" under a per se analysis, *see supra* text accompanying notes 772-77, the measurement of foreclosure under the rule of reason is a distinct question.

801. *See* *United States v. Microsoft Corp.*, 253 F.3d 34, 51, 54 (D.C. Cir. 2001); *New York v. Microsoft Corp.*, 224 F. Supp. 2d 76, 157 (D.D.C. 2002); *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 19, ¶ 35 (D.D.C. 1999) (noting that Windows had over 95% of the market share); Plaintiff Litigating States' Proposed Findings of Fact, *supra* note 432, ¶ 32, at 15 (citing estimate of Michael Tiemann, Red Hat, Inc.'s chief technical officer, that Windows continues to have a 95% share of the relevant market); *id.* ¶ 93, at 36 (citing University of California at Berkeley business professor Carl Shapiro's estimate of Internet Explorer's usage share as "nearly 90%").

802. Microsoft discontinued its "mainstream support" for Windows 95 on December 31, 2000. *See* MICROSOFT CORP., PRODUCT LIFECYCLE DATES – WINDOWS PRODUCT FAMILY, *at* [http://support.microsoft.com/default.aspx?scid=fh;\[ln\];LifeWin](http://support.microsoft.com/default.aspx?scid=fh;[ln];LifeWin) (last modified Sept. 24, 2004).

803. *See supra* text accompanying notes 778-81.

804. *See* Microsoft's Proposed Findings of Fact, *supra* note 17, ¶¶ 427-34.

outcome.⁸⁰⁵ Thus, even though Judge Jackson had specifically found that “superior quality was not responsible for the dramatic rise [in] Internet Explorer’s usage share”⁸⁰⁶ from less than 5% in early 1996⁸⁰⁷ to more than 50% in 1999⁸⁰⁸—a period during which any network effects would have favored Navigator—Microsoft might have been able to demonstrate on remand that its subsequent gains from 1999 to 2003 had been due entirely to quality improvements or network effects. Such a showing would tend to absolve Microsoft of liability under section 2 for monopolization of the tied market.⁸⁰⁹ It could not, however, have altered the court’s characterization of the effects of Microsoft’s tying conduct, because Judge Kollar-Kotelly would not have been free to accept Microsoft’s benign explanations as reasonably accounting for all of the market share gains that had led

805. See John E. Lopatka & William H. Page, *Devising a Microsoft Remedy That Serves Consumers*, 9 GEO. MASON L. REV. 691, 705-06 (2001) (noting that network effects are “less pronounced” for Web browsers than for operating systems, but concluding that “[o]n balance, the market may be one conducive to a dominant firm. . . . So once again, we can assume that a monopolist might emerge in a browser market devoid of exclusionary acts.”); cf. Economides, *supra* note 26, at 12 (“[T]he fact that the natural equilibrium in network industries is winner-take-most with very significant market inequality does not imply that competition is weak.”); Evans & Schmalensee, *supra* note 26, at 85 (“Microsoft’s intention to compete hard enough to maintain its market position necessarily entailed excluding Netscape from a major role in the platform business.”); Richard Schmalensee, *Antitrust Issues in Schumpeterian Industries*, 90 AM. ECON. REV. 192, 194 (2000) (“In a ‘winner take most’ market, evidence that A intends to kill B merely confirms A’s desire to survive.”). *But see* LIEBOWITZ & MARGOLIS, *supra* note 26, at 220 (“The browser market is still another market that does not seem to exhibit either inertia, lock-in, or tipping.”). See generally Michael L. Katz & Carl Shapiro, *Network Externalities, Competition, and Compatibility*, 75 AM. ECON. REV. 424, 424 (1985) (describing network externalities as existing when consumers tend to prefer the same product that other consumers have).

806. *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 102, ¶ 375; see also *id.* at 98, ¶ 358 (finding that the usage shares of Internet Explorer and Navigator “would not have changed nearly as much as they did . . . had Microsoft not devoted its monopoly power and monopoly profits to precisely that end”).

807. See *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 98-99, ¶ 360.

808. See *id.* at 101-02, ¶ 372 (finding that Internet Explorer’s share of browser usage already exceeded 50% as of November 1999 and was increasing).

809. See *United States v. Grinnell Corp.*, 384 U.S. 563, 570-71 (1966) (“The offense of monopoly under § 2 of the Sherman Act 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.”).

to its monopoly in that market.⁸¹⁰ The plaintiffs would therefore have succeeded on remand in establishing a prima facie case that Microsoft's tying conduct harmed competition in the tied market.

G. Microsoft's Proffered Justifications

At trial, Microsoft had addressed the D.C. Circuit's "plausible benefits" standard for the separate products inquiry by claiming a wide range of benefits to consumers resulting from Microsoft's "integration" of Internet Explorer into Windows 98.⁸¹¹ Although Judge Jackson's findings of fact appeared to dismiss these claims of plausible benefits in their entirety,⁸¹² Judge Jackson ultimately held Microsoft liable for tying under a per se approach that did not involve a review of the defendant's justifications.⁸¹³ In remanding the tying claim for a determination of liability under the rule of reason, the D.C. Circuit instructed the district court to reexamine Microsoft's justifications, this time to determine whether "the anticompetitive effect of the [challenged] conduct outweighs its benefit."⁸¹⁴ As presented at trial, these justifications fell into three categories: benefits attributable to the inclusion of certain shared code in the software that accompanies Windows 98, benefits from the free provision of a useful software feature, and benefits from the provision of "seamless" navigation between local and remote information resources.

1. Benefits of Software Inclusion and Sharing

Microsoft used the term "Internet Explorer technologies" to refer to the shared software libraries accompanying Windows 98 that supported Microsoft's Web browser software product.⁸¹⁵ These Internet Explorer technologies also served to support Microsoft's operating system software product as well as many applications software products designed for the Windows 98 platform and, in these respects, were no different from any of the other shared

810. *See* *New York v. Microsoft Corp.*, 224 F. Supp. 2d 76, 98 (D.D.C. 2002) (concluding that Judge Jackson's findings of fact were the law of the case throughout the remand proceedings).

811. *See supra* text accompanying notes 262-71.

812. *See* *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 55, ¶ 186 ("No consumer benefit can be ascribed, however, to Microsoft's refusal to offer a version of Windows 95 or Windows 98 without Internet Explorer, or to Microsoft's refusal to provide a method for uninstalling Internet Explorer from Windows 98.").

813. *See supra* text accompanying notes 306-16.

814. *United States v. Microsoft Corp.*, 253 F.3d 34, 95 (D.C. Cir. 2001).

815. *See supra* text accompanying notes 202-03.

software accompanying Windows 98.⁸¹⁶

According to Microsoft, the inclusion of Internet Explorer technologies in the software accompanying Windows 98 resulted in numerous benefits to consumers and software vendors. First, Internet Explorer technologies support many features of Microsoft's operating system software product that consumers find useful,⁸¹⁷ including the Windows 98 user interface and the Windows Help and Windows Update features.⁸¹⁸ Second, Internet Explorer technologies serve as platform software for a wide range of "Internet-aware" software products developed and marketed by other vendors,⁸¹⁹ including "shell browsers."⁸²⁰ Third, by designing, developing, and testing the Internet Explorer technologies alongside all of the other software accompanying Windows 98, Microsoft was able to ensure that the software worked well together.⁸²¹ Finally, Internet Explorer technologies conserved memory by permitting the same software code to support Windows 98's operating system and Web browser features.⁸²²

Regardless of how compelling these benefits may be, they do not serve to justify Microsoft's tying conduct. As the first principles approach clarifies, Windows 98 contains both an operating system

816. See *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 54-55, ¶ 183 ("Microsoft did not offer any analytical basis, however, for distinguishing this sharing of code from the code sharing that exists between all Windows applications and the operating system functionalities in Windows 98."); Randal C. Picker, *Pursuing a Remedy in Microsoft: The Declining Need for Centralized Coordination in a Networked World*, 158 J. INSTITUTIONAL & THEORETICAL ECON. 113, 114 (2002) ("Software sharing is the norm. By this I mean that one piece of software will look to another piece of software for some of its functionality. Without intending too much by these words, one 'application' might look to another 'application' or an 'application' might look to the 'operating system' for this shared code."); see also Microsoft's Proposed Findings of Fact, *supra* note 17, ¶ 538 (citing testimony of Microsoft witness Mike Devlin that "Rational [Software Corp.] views the APIs exposed by Internet Explorer as indistinguishable from other APIs exposed by Windows").

817. See Microsoft's Proposed Findings of Fact, *supra* note 17, ¶ 539. ("Internet Explorer provides core operating system functionality.")

818. See *id.* ¶¶ 544, 547-48, 550-52.

819. See *id.* ¶¶ 538, 539(i), 553-59, 562, 564, 781, 784, 787.

820. See *supra* text accompanying note 579. Because shell browsers "rel[y] on Internet Explorer to do the actual work of connecting to the Internet and displaying retrieved information," Microsoft's Proposed Findings of Fact, *supra* note 17, ¶ 425, they can provide quality competition to Internet Explorer only with respect to a very limited range of competitive variables. In any case, this benefit can be achieved without Microsoft's tying conduct. See *infra* text accompanying notes 832-36.

821. See Microsoft's Proposed Findings of Fact, *supra* note 17, ¶ 528.

822. See *id.* ¶ 541.

software product and a Web browser software product, each of which respectively permits the limited copying and adaptation of the accompanying software for a separate and distinct set of purposes.⁸²³ Professor Felten's program demonstrated the technological feasibility of providing these products separately.⁸²⁴

Taken separately, Microsoft's operating system software product is accompanied by all of the software that accompanies Windows 98, and includes sufficient legal rights and technological capabilities to install and run that software for the purposes of supporting the operating system's user interface and other features,⁸²⁵ accessing the latest software and documentation accompanying the operating system software product via the Windows Help and Windows Update features,⁸²⁶ and serving as platform software for "Internet-aware" software products.⁸²⁷ Because the same software code accompanying Windows 98 supports both Microsoft's operating system and Web browser software products,⁸²⁸ a consumer who chooses to install and use both products together will enjoy all of the benefits of their contemporaneous development and sharing of code. Because Microsoft's tying conduct was not necessary to obtain any of the benefits it claimed from the inclusion of Internet Explorer technologies in the software accompanying Windows 98, the plaintiffs would have succeeded on remand in rebutting these proffered justifications.⁸²⁹

823. See *supra* text accompanying note 540.

824. See *supra* text accompanying notes 561-69.

825. See *Antitrust Analysis, supra* note 28, at 41 (identifying the user interface as part of the implementation of the software product).

826. Because the Windows Help and Windows Update features are the means by which Microsoft chose to provide technological access to the latest software and documentation accompanying the Windows 98 software product, Microsoft's operating system software product necessarily includes sufficient legal rights and technological capabilities to use those features. See *Antitrust Analysis, supra* note 28, at 26 (explaining that a software product "consists essentially of the necessary legal rights, and technological capabilities, to install and run the software on a system according to the documentation").

827. See *supra* text accompanying notes 531-33 (defining "operating system software product" to include platform support for other software products).

828. See *supra* text accompanying note 533.

829. The rebuttal of Microsoft's proffered justifications for overriding the user's choice of default browser with respect to the § 1 tying claim would also have served to rebut the same proffered justifications with respect to the § 2 monopoly maintenance claim, some of which were credited by the D.C. Circuit. See *supra* text accompanying notes 394-99.

2. *Benefits of Free Provision*

Microsoft also argued that the inclusion of “Web browsing software” in Windows 98 at no extra charge resulted in vigorous price competition, with the beneficial effects of “reduc[ing] the effective price of Web browsing software to zero”⁸³⁰ and “increas[ing] distribution of Web browsing software.”⁸³¹ Microsoft’s tying condition, however, was not necessary to achieve these benefits. Microsoft could have offered its operating system and Web browser software products in Windows 98 separately without imposing this tying condition;⁸³² and in so doing, Microsoft could have priced its Web browser software product at zero. Moreover, the tying claim did not actually challenge the inclusion of Microsoft’s Web browser software product in Windows 98.⁸³³ Rather, it challenged the conditioning of the sale of Microsoft’s operating system software product on the purchase of Microsoft’s Web browser software product.⁸³⁴ Thus, these proffered justifications of reduced price and increased output would also have been successfully rebutted.

Given that the present rule-of-reason analysis was itself premised on an imprecise characterization of the tying claim,⁸³⁵ we might consider instead whether Microsoft’s tying conduct might have served as a vehicle for price competition in the tied market. As the Areeda treatise has observed, however, “the tie that amounts to a price cut on the tied product requires no power in the tying product to induce customers to accept the tie.”⁸³⁶ Such a “bargain tie” theory would therefore be at odds with Judge Jackson’s findings that OEMs acquiesced in Microsoft’s tying restrictions only “because they perceived no alternative to licensing Windows,” the tying

830. See Microsoft’s Proposed Findings of Fact, *supra* note 17, ¶ 780; see also *id.* ¶¶ 783, 786 (describing the inclusion of Internet Explorer technologies in Windows 98 as a “major improvement[]” that effectively reduced the quality-adjusted price of Windows below that of the initial release of Windows 95).

831. See *id.* ¶ 782; see also *id.* ¶ 543 (noting that Windows 98 requires no separate installation for Internet Explorer); *id.* ¶ 785 (arguing that “Microsoft’s development of high quality Web browsing software and inclusion of Internet support in Windows have certainly contributed to more widespread use of the Internet”).

832. See *supra* text accompanying notes 662-68.

833. See *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 56, ¶ 191 (D.D.C. 1999) (“Microsoft could offer consumers all the benefits of the current Windows 98 package by distributing the [operating system and Web browser software] products separately and allowing OEMs or consumers themselves to combine the products if they wished.”).

834. See *supra* Part IV.E (describing the challenged conduct).

835. See *supra* text accompanying notes 682-86.

836. IX AREEDA, *supra* note 90, ¶ 1715d2, at 180 n.30.

product.⁸³⁷ In any case, Microsoft never advanced such a theory during the litigation.

Finally, we might consider whether it is proper to find consumer harm from the foreclosure of quality competition,⁸³⁸ even in a market where price competition has driven the prevailing price to zero. Regarding this, it should be observed that quality competition has generally been recognized as a proper subject of antitrust concern.⁸³⁹ Moreover, in this particular case, Judge Jackson specifically identified several economic “costs, risks, and benefits” to the consumer as the objects of quality competition in the tied market, including the avoidance of “viruses that are capable of causing devastating and irreversible harm.”⁸⁴⁰ Given that Microsoft has yet to deliver a “best of breed” Web browser software product,⁸⁴¹ the prevailing price of zero may well be serving to conceal poor market performance from the standpoint of quality-adjusted price.⁸⁴²

3. Benefits of “Seamless Browsing”

According to Microsoft, the design of Windows 98 “provided usability benefits to certain consumers” by allowing them to “view local and remotely stored information in a consistent manner.”⁸⁴³

837. United States v. Microsoft Corp., 84 F. Supp. 2d at 662, ¶ 215.

838. See *supra* text accompanying notes 778-81.

839. See *Antitrust Analysis*, *supra* note 28, at 21-22 & nn.132, 134, 135.

840. United States v. Microsoft Corp., 84 F. Supp. 2d at 57-58, ¶¶ 197-98.

841. See *supra* note 779; see also Microsoft Corp., *Security Bulletins*, at <http://www.microsoft.com/security/bulletins/default.aspx> (last updated Jan. 11, 2005) (providing information about security and privacy vulnerabilities in various Microsoft software products including Internet Explorer). *But see* Robert H. Lande & James Langenfeld, *The Perfect Caper? Private Damages and the Microsoft Case*, 69 GEO. WASH. L. REV. 902, 910 (2001) (suggesting that “IE is an extremely good product, so it could be difficult for aggrieved plaintiffs to prove significant damages from their lack of choice” in a private tying challenge).

842. Various commentators have recognized one notable aspect of this market failure in characterizing the ubiquity of Microsoft software products as a “monoculture” that has facilitated the rapid spread of viruses to PCs via the Internet. See, e.g., Neal Kumar Katyal, *Criminal Law in Cyberspace*, 149 U. PA. L. REV. 1003, 1106 n.271 (2001) (“But because virtually everyone (for now, at least) uses Outlook [Microsoft’s e-mail program], the virus spread from Manila to Milan in minutes.”); Brett Glass, *Browser Monoculture Sets Stage for Mass Infections*, EXTREMETECH.COM, Dec. 18, 2002, available at 2002 WL 25893814; Charles Piller, *Ubiquitousness of Microsoft Opens Window to Trouble*, L.A. TIMES, June 5, 2000, at C1 (“[M]onopoly is the sworn enemy of software security. Network saboteurs would face monumentally harder challenges if a single company’s tightly linked products didn’t run the vast majority of the world’s computers.”).

843. Microsoft’s Proposed Findings of Fact, *supra* note 17, ¶ 545.

Specifically, Microsoft provided users with the ability to navigate between the computer system's hard drive and the Web without selecting and launching a Web browser software product to support the resulting Web transaction or causing the Windows 98 user interface to open a new window.⁸⁴⁴ Noting that “[o]perating systems have long enabled consumers to find and view information on various types of storage devices,”⁸⁴⁵ Microsoft described this “seamless browsing” capability as an improvement to Microsoft's operating system software product in response to the emergence of a “new information storage device[]”: the Internet.⁸⁴⁶ In short, Windows 98 provides “a means to access information without regard to where it is located.”⁸⁴⁷

As explained above,⁸⁴⁸ Microsoft's tying conduct was not necessary to provide seamless browsing to consumers who chose to install and use both Microsoft's operating system and Web browser software products in Windows 98. Microsoft's description of seamless browsing as an extension of the functionality of Microsoft's operating system software product might, however, be taken as a challenge to the product and product market definitions on which the present analysis has been based.⁸⁴⁹

844. *See id.* ¶¶ 545, 547(i).

845. *Id.* ¶ 532. As Microsoft's James Allchin has explained:

By 1994, Windows already included support for the protocols, formats and addressing conventions used to access information on a computer's hard drive, floppy drive, tape drive, CD-ROM drive, local and wide area networks and so forth, whether that information consisted of documents, audio files or other means of presenting information. And Windows already included user interface software (such as Windows Explorer) for browsing information in all of these formats. Conceptually, the Web is just another place to access information, akin to any of the information sources listed above. So it was natural to provide support in Windows for the Internet standards we thought would be widely deployed in the future.

Allchin Direct Testimony, *supra* note 256, ¶ 78.

846. *See* Microsoft's Proposed Findings of Fact, *supra* note 17, ¶ 532 (“As new information storage devices have been created over time, operating systems have been improved to permit consumers to locate and view information stored in those devices. The Internet is merely the latest step in a trend toward broader access to information going back to the earliest days of personal computers.”).

847. *See id.* ¶ 539.

848. *See supra* text accompanying notes 828-29.

849. *See, e.g.,* Stuart Minor Benjamin, *Stepping into the Same River Twice: Rapidly Changing Facts and the Appellate Process*, 78 TEX. L. REV. 269, 302 (1999) (suggesting that market definitions in *Microsoft* are “constantly morphing” and that tying relief will eventually be “premised on a separation of functions that either has changed significantly or, perhaps, simply no longer exists”); David Post, *Wiping Away Windows*, AM. LAW., June 1998, at 83

find and view information

USER INTENTION	SYSTEM RESPONSIBILITY
	present (meta-)information about information resources
select information resource	offer choice of information resources
perceive information resource	present information resource

Figure 3. A possible essential use case for the task of finding and viewing information resources.

(arguing that a holding of tying liability based on a finding of separate products, “in a technology marketplace in which markets and products are in a state of constant flux . . . seems downright bizarre”).

Samuel Weinstein has argued that, where there is “overwhelming evidence that the integration is a genuine technological advance,” courts should disregard a finding of separate markets and conclude that the challenged tie-in is a single product. See Samuel Noah Weinstein, Comment, *Bundles of Trouble: The Possibilities for a New Separate-Product Test in Technology Tying Cases*, 90 CAL. L. REV. 903, 954 (2002). Weinstein concludes that *Microsoft* does not present such a case because the record lacks substantial evidence that the “Windows-IE integration is a genuine technological advance.” *Id.* at 956. Since Microsoft would not hesitate to dispute this assessment of the significance of “seamless browsing,” Weinstein’s approach is too imprecise and subjective to provide adequate guidance for determining when new features of a defendant’s software product may serve to disrupt existing product market definitions.

Gregory Sidak recommends that where a tying challenge is brought to a “product integration” in a “technologically dynamic” market, plaintiffs should have the additional burden of showing that consumer welfare losses attributable to the preservation of a monopoly over the tying product exceed the consumer welfare gains from subadditive costs or superadditive demand, essentially transforming the analysis into a rule of reason inquiry. See Sidak, *supra* note 308, at 28-33. Sidak’s concern is that products in “technologically dynamic” markets may not be as “well-defined” as those in “technologically mature” markets, “both by the consumer demand that they satisfy and by the production technology through which firms supply them.” *Id.* at 28. Sidak’s criteria for identifying “technologically dynamic” markets, however, do not even attempt to account for changes in the user purposes for which the software products at issue are supplied and demanded; they are simply an unstructured set of economic indicators associated with high-technology industries. See *id.* at 26-27 (listing such factors as price-adjusted performance over time, market penetration and diffusion, R&D expenditures, new business formations and business failures, mobility of the skilled labor market, market capitalization in relation to asset value, and stock market returns in relation to the Dow Jones Industrial Average). The likely effect of Sidak’s approach would be to immunize the software industry from per se tying condemnation.

Specifically, if the Web is coming to be regarded as just another “information storage device” from which an operating system software product enables a user to select, retrieve, and perceive information resources,⁸⁵⁰ then the user purpose of performing a Web transaction, as expressed in the essential use case of Figure 2, may eventually cease to be a complete, meaningful and well-defined end use that can be targeted for price discrimination.⁸⁵¹ It would then seem appropriate to abstract away the distinction between the Internet and other “types of storage devices” by generalizing the user purpose of performing a Web transaction to encompass “access[ing] information without regard to where it is located,” as shown in Figure 3.

Even if the essential use case in Figure 3 might someday serve as a basis for product market definition, however, it could not have served in *Microsoft* as a basis for defining a relevant product market in which Windows 98 competes. While an essential use case may abstract away specific technological solutions, it must not abstract away specific problems that are of intrinsic interest to the user.⁸⁵² The essential use case in Figure 3, however, does precisely that. It abstracts away the problem of information retrieval—copying information from a physical medium that is neither proximate to the user nor under the technological control of the user’s system into a physical medium that is both proximate to the user and under the system’s technological control.

Windows 98 does not signify a movement from product markets based on the essential use case of Figure 2 to product markets based on the essential use case of Figure 3, because it does not diminish the user’s intrinsic interest in the problem of information retrieval. This retrieval problem will continue to be of intrinsic interest to any user who wishes to perceive Web resources for as long as the Web exists as “a massive collection of digital information resources stored on servers throughout the Internet.”⁸⁵³ Because Web resources in general are stored on physical media (Web servers) that are neither in physical proximity to a Web user nor under the technological control of the user’s system, they cannot be physically perceived by the user and can be modified or deleted at any time without the user’s knowledge or consent. A user who wishes to perceive a Web resource must therefore create a copy of the resource in a physical medium that is in physical proximity to the user and under the

850. See *supra* notes 845-46 and accompanying text.

851. See *supra* text accompanying notes 557-67.

852. See *Antitrust Analysis, supra* note 28, at 31.

853. *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 13, ¶ 12 (D.D.C. 1999).

technological control of the user's system for a sufficient duration to perceive the resource. The innovations (or manipulations)⁸⁵⁴ of designers and vendors in creating new software products, the preferences of consumers for more intuitive user interfaces, and the opinions of computer scientists as to what constitutes an operating system all can do nothing to change these facts.

Nor does Windows 98 relieve the user of the inherent economic and legal consequences of information retrieval. As Judge Jackson found, while "immense value . . . subsists in the digital information resources that have become available on the Web,"⁸⁵⁵ the retrieval of certain Web resources may cause "devastating and irreversible harm."⁸⁵⁶ The retrieval of Web resources also may result in copyright liability, because many Web resources are published without the copyright owner's authorization.⁸⁵⁷

It is unsurprising that the emergence of seamless browsing does not disturb the definition of the market for Web browser software products for Windows 98 derived in Part IV.B. In particular, Microsoft's provision of seamless browsing is more accurately and naturally characterized as an extension of the applicability of a particular technological solution (the Windows 98 user interface) to serve multiple user purposes, than as a generalization of one or more purposes and/or problems that are of intrinsic interest to the user and constitute complete, meaningful and well-defined end uses. This characterization fully accounts for the consumer benefits of Microsoft's innovation. Under the first principles approach, to the extent that consumers experience usability benefits from seamless browsing, such benefits are fully reflected in the competitive variables that measure the usability of the designs and implementations of various operating system and Web browser

854. See, e.g., Government's Exhibit 378: Email from Yusuf Mehdi to Jim Allchin (Feb. 17, 1998, 8:24 PM), *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. 1999) (Civ. No. 98-1232) (urging that "someone [do] a thorough walk-through" to correct aspects of the Windows 98 user interface that make Internet Explorer "appear separate," and reporting "good progress" in ensuring that Microsoft's Web site no longer uses the terms "product" and "browser" to refer to Internet Explorer).

855. *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 58, ¶ 201.

856. *Id.* at 57-58, ¶ 197; see also *Microsoft Corp.*, *Security Bulletins*, at <http://www.microsoft.com/security/bulletins/default.mspx> (last updated Jan. 11, 2005) (providing information about security and privacy vulnerabilities in various Microsoft software products including Internet Explorer).

857. See, e.g., Doris Estelle Long, *E-Business Solutions to Internet Piracy: A Practical Guide*, in *HANDLING INTELLECTUAL PROPERTY ISSUES IN BUSINESS TRANSACTIONS* 2003, at 769 (PLI Intellectual Property Course, Handbook Series No. G-740, 2003) (surveying Internet piracy, including Web sites that carry pirated software, films, and music).

software products, including their respective user interfaces. If, informed by these competitive variables, consumers prefer seamless browsing, “they do not have to be forced to take it; they can choose it in the market”⁸⁵⁸—and they *will* do so in a well-functioning market. The availability of this less restrictive alternative serves to rebut Microsoft’s “seamless browsing” justification.

H. Summary

The first principles approach supports the conclusion that the conduct challenged under the *Microsoft* tying claim satisfied all of the generally required elements of a per se illegal tying arrangement: separate tying and tied products,⁸⁵⁹ the conditioning of the sale of the tying product on the purchase of the tied product,⁸⁶⁰ sufficient market power in the tying product market to enable it to restrain trade in the tied product market,⁸⁶¹ and an effect on a not insubstantial amount of interstate commerce.⁸⁶²

This conclusion is robust with respect to doctrinal variations. Microsoft’s conduct does not involve the kind of product interdependence that might warrant more lenient treatment under “technological tying” precedents.⁸⁶³ Still, the element of separate tying and tied products is satisfied regardless of whether the *Jefferson Parish* or “facially plausible benefits” test is used.⁸⁶⁴

Moreover, the first principles approach does not support a departure from either the *Jefferson Parish* test for separate products or the per se rule in the case of the *Microsoft* tying claim.⁸⁶⁵ Nevertheless, the plaintiffs would still have been able to prevail on their tying claim on remand, where the residual rule of reason was the only available basis for liability. Under the Areeda treatise’s guidelines for measuring the foreclosure from a tie-in under the rule of reason, Microsoft’s conduct would have been characterized as a large-foreclosure tie that had presumptively resulted in an anticompetitive effect, namely the establishment of a monopoly in

858. *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 56, ¶ 191 (“Microsoft could offer consumers all the benefits of the current Windows 98 package by distributing the [operating system and Web browser software] products separately and allowing OEMs or consumers themselves to combine the products if they wished.”); *see supra* text accompanying note 848.

859. *See supra* Part IV.D.

860. *See supra* text accompanying notes 702-15.

861. *See supra* text accompanying notes 615-26.

862. *See supra* text accompanying notes 733-35.

863. *See supra* text accompanying notes 721-25.

864. *See supra* text accompanying notes 633-69.

865. *See supra* text accompanying notes 682-86.

the tied product market,⁸⁶⁶ and Microsoft would not have succeeded in rebutting the plaintiffs' prima facie showing of anticompetitive effect.⁸⁶⁷ Moreover, as was required by the D.C. Circuit on remand, the tied product market in which this anticompetitive effect occurred would have been defined on the basis of entry barriers that were implicit in the challenged conduct.⁸⁶⁸ The plaintiffs would have succeeded in rebutting all of Microsoft's proffered justifications because all of Microsoft's claimed benefits from "integration" could have been achieved without the challenged conduct.⁸⁶⁹ Finally, the innovative nature of Windows 98's "seamless browsing" feature does not disturb our characterizations of the tying and tied product markets in any of the foregoing analyses.⁸⁷⁰

Those analyses, while admittedly long and complicated, yield a succinct conclusion: Judge Jackson's findings of fact support a legal conclusion of liability under every doctrinal approach that was applied or proposed during the *Microsoft* tying claim's litigation history. Regardless of which approach is followed, the first principles approach leads to the same "essential inquiry" and the same conclusion.⁸⁷¹ The plaintiffs' decision not only to drop the tying claim prior to the remand proceedings but also to disparage and mischaracterize that claim as "a direct assault on Microsoft's ability to . . . integrate new functions into Windows,"⁸⁷² was entirely unnecessary and did not serve the public interest.⁸⁷³

866. See *supra* text accompanying notes 791-803.

867. See *supra* text accompanying notes 804-10.

868. See *supra* text accompanying notes 609-11.

869. See *supra* text accompanying notes 823-29.

870. See *supra* text accompanying notes 843-58.

871. See *Nat'l Collegiate Athletic Ass'n v. Bd. of Regents of the Univ. of Okla.*, 468 U.S. 85, 103-04 (1984). Justice Stevens stated that:

Per se rules are invoked when surrounding circumstances make the likelihood of anticompetitive conduct so great as to render unjustified further examination of the challenged conduct. But whether the ultimate finding is the product of a presumption or actual market analysis, the essential inquiry remains the same—whether or not the challenged restraint enhances competition.

Id. (citations omitted).

872. See *supra* text accompanying notes 413-14 (quoting Assistant Attorney General Charles A. James).

873. For an argument that Microsoft's lobbying efforts influenced the Justice Department's handling of the case, see Kenneth R. Mayer, *Political Realities and Unintended Consequences: Why Campaign Finance Reform Is Too Important to Be Left to the Lawyers*, 37 U. RICH. L. REV. 1069, 1076-83 (2003); Paula Rooney, *Down But Not Out*, CRN, June 26, 2000, at 186 (noting Microsoft's political contributions to Republican candidates and quoting Thomas Hazlett's statement that "Microsoft would get a second wind if Bush took over because there would be a new attorney general for antitrust . . . [a]nd

*I. Further Issues**1. Monopoly Leveraging*

As I have already noted, Judge Jackson's dismissal of the states' monopoly leveraging claim was premised on a factual determination that Microsoft's only "incentive" in combining its PC operating system and Web browser software products was "to extract all possible monopoly profits."⁸⁷⁴ This determination, however, did not appear to have any evidentiary basis and was squarely contradicted by Judge Jackson's eventual conclusion that Microsoft's tying conduct had the purpose and effect of blunting Navigator's middleware threat to Microsoft's operating systems monopoly.⁸⁷⁵

The apparent lack of factual support for Judge Jackson's grant of summary judgment is problematic because, as the Supreme Court has recognized, market imperfections proven at trial may call the "single monopoly profit" theory into question.⁸⁷⁶ In *Eastman Kodak Co. v. Image Technical Services, Inc.*,⁸⁷⁷ the plaintiff independent service organizations (ISOs) brought a tying challenge to, *inter alia*, Kodak's introduction of a policy of selling replacement parts for its copiers only to customers who also contracted with Kodak for service and maintenance.⁸⁷⁸ In granting Kodak's motion for summary judgment, the district court concluded that there was no tying arrangement between Kodak copiers and service, but failed to address the claim that there was a tying arrangement between Kodak parts and service.⁸⁷⁹ On appeal to the Ninth Circuit, Kodak argued that there was no possibility of exploiting the policy to charge supracompetitive prices for Kodak parts or services, because

I'd not be shocked to see the new AG not liking the case"). One of the Areeda treatise's co-authors has suggested the more benign explanation that a proof of anticompetitive effects from tying would have "entailed lengthy discovery, putting off any relief for two to three years." See Einer Elhauge, Public Forum, *A Smart Move on Microsoft*, BOSTON GLOBE, Sept. 11, 2001, at C4. Under a first principles approach to the tying claim, however, no such discovery would have been necessary, as anticompetitive effects could have been inferred from Judge Jackson's findings of fact. See *supra* Part IV.F.

874. See *supra* text accompanying notes 195-201.

875. See *supra* text accompanying notes 326-29.

876. See *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 15 n.24 (1984) ("Especially where market imperfections exist, purchasers may not be fully sensitive to the price or quality implications of a tying arrangement, and hence it may impede competition on the merits"); see also Richard Craswell, *Tying Requirements in Competitive Markets: The Consumer Protection Issues*, 62 B.U. L. REV. 661, 666-68 (1982).

877. 504 U.S. 451 (1992).

878. *Id.* at 458-59.

879. *Id.* at 459.

any additional profits would be offset by the loss of customers who would turn to a competing supplier of new copiers.⁸⁸⁰ As the court of appeals noted, this “theoretical” argument was equivalent to the claim that “equipment purchasers would turn to one of Kodak’s competitors if Kodak tied supracompetitively priced parts or service directly to equipment.”⁸⁸¹ Against this, the plaintiffs had presented pricing evidence tending to show that “competition in the interbrand market does not, in reality, curb Kodak’s power in the parts market.”⁸⁸² Noting that “market imperfections can keep economic theories about how consumers will act from mirroring reality,” the Court of Appeals held that the plaintiffs’ evidence raised an issue of fact precluding summary judgment, and reversed the district court.⁸⁸³

The Supreme Court granted certiorari to consider “whether a defendant’s lack of market power in the primary equipment market precludes—as a matter of law—the possibility of market power in derivative aftermarkets.”⁸⁸⁴ “Kodak [did] not present any actual data on the equipment, service, or parts markets,”⁸⁸⁵ but instead relied on the contention that the plaintiffs’ claims made “no economic sense.”⁸⁸⁶ The Court, however, credited the plaintiffs with “offer[ing] a forceful reason why Kodak’s theory, although perhaps intuitively appealing, may not accurately explain the behavior of the primary and derivative markets for complex durable goods: the existence of significant information and switching costs.”⁸⁸⁷ Because “[l]ifecycle pricing of complex, durable equipment is difficult and costly,”⁸⁸⁸ and requires the knowledge of information much of which is “difficult— . . . [or] impossible—to acquire at the time of purchase,”⁸⁸⁹ the Court concluded that “it makes little sense to assume, in the absence of any evidentiary support, that equipment-purchasing decisions are based on an accurate assessment of the total cost of equipment, service, and parts over the lifetime of the machine.”⁸⁹⁰ Moreover, the Court noted that the consumers who had

880. See *Image Technical Serv., Inc. v. Eastman Kodak Co.*, 903 F.2d 612, 616-17 (9th Cir. 1990), *aff’d*, 504 U.S. 451 (1992).

881. *Id.* at 617.

882. *Id.*

883. *Id.* at 617-19.

884. *Eastman Kodak*, 504 U.S. at 454-55.

885. *Id.* at 466.

886. *Id.* at 467-68 (quoting *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 587 (1986)).

887. *Id.* at 473.

888. *Id.*

889. *Id.*

890. *Id.* at 475-76.

purchased Kodak copiers before Kodak introduced its policy would be “locked in” by the high cost of switching to different equipment, and would therefore tolerate some amount of supracompetitive prices without switching brands.⁸⁹¹ Holding that there existed a question of fact regarding “whether information costs and switching costs foil the simple assumption that the equipment and service markets act as pure complements to one another,” the Court affirmed the denial of Kodak’s motion for summary judgment.⁸⁹² While the Court did not explicitly address monopoly leveraging, it did reaffirm in a footnote its longstanding holding that “power gained through some natural and legal advantage such as a patent, copyright, or business acumen can give rise to liability if ‘a seller exploits his dominant position in one market to expand his empire into the next.’”⁸⁹³

Judge Jackson’s grant of summary judgment to Microsoft on the monopoly leveraging claim, solely on the basis of the “single monopoly profit” theory, and in the absence of any evidentiary support, appears to be at odds with the Supreme Court’s *Eastman Kodak* decision. Judge Jackson specifically found that consumers “frequently lack adequate information to enable them to assess accurately the costs, risks, and benefits” of using a Web browser software product.⁸⁹⁴ It therefore makes little sense to assume that consumers will accurately account for the lifetime costs, risks, and benefits of using a Web browser software product when deciding to buy it in a bundle with Microsoft’s monopoly operating system software product. Judge Jackson also found that consumers who had been using older versions of Windows prior to Microsoft’s tying conduct and had sunk costs in Windows applications would face relatively high costs of switching to other operating system software products compared to the cost of upgrading to Windows 98.⁸⁹⁵ These consumers would therefore tolerate some amount of supracompetitive (quality-adjusted) prices before switching to a non-Windows operating system.⁸⁹⁶ Information costs and switching costs

891. *See id.* at 476.

892. *Id.* at 477, 479.

893. *Id.* at 479-81 n.29 (quoting *Times-Picayune Publ’g Co. v. United States*, 345 U.S. 594, 611 (1953)).

894. *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 57-58, ¶ 197 (D.D.C. 1999).

895. *See id.* at 19, ¶¶ 21-22, 36, 44 (finding that “no applications barrier stands in the way of consumers adopting” successive versions of Windows).

896. *Id.* at 19, ¶ 36. Some lower courts have read the holding of *Eastman Kodak* as being limited to the case where there was a change in policy that enabled the defendant to exploit its locked-in customers. *See, e.g.*, *Queen City Pizza, Inc. v. Domino’s Pizza, Inc.*, 124 F.3d 430, 440 (3d Cir. 1997); *PSI Repair*

therefore challenge the “single monopoly profit” theory as an explanation for the behavior of the markets for operating system and Web browser software products.

If Judge Jackson had not granted summary judgment, it seems likely that the plaintiffs could have prevailed on the monopoly leveraging claim, at least under the Second and Federal Circuit standards. Those circuits require that “the [leveraged] market is properly defined” and “the alleged conduct threatens the [leveraged] market with the higher prices or reduced output or quality associated with the kind of monopoly that is ordinarily accompanied by large market share.”⁸⁹⁷ Under a first principles analysis of the tying claim, the plaintiffs could have satisfied this standard by formulating a properly defined market for Web browser software products for Windows 98⁸⁹⁸ and then demonstrating that Microsoft’s tying conduct reduced the quality of all rival products in that market, thereby preventing the market from performing as a well-functioning software product market.⁸⁹⁹

The *Microsoft* monopoly leveraging claim may seem duplicative, because it is predicated on the same facts as the tying claim. Compared with the tying doctrine, however, the monopoly leveraging doctrine seems simpler and more explicitly applicable to the questions of quality competition at issue in the case.⁹⁰⁰ Judge

Servs., Inc. v. Honeywell, Inc., 104 F.3d 811, 818-20 (6th Cir. 1997); United Farmers Agents Ass’n v. Farmers Ins. Exch., 89 F.3d 233, 237-38 (5th Cir. 1996); Digital Equip. Corp. v. Uniq Digital Techs., Inc., 73 F.3d 756, 763 (7th Cir. 1996); Lee v. Life Ins. Co. of N. Am., 23 F.3d 14, 19-20 (1st Cir. 1994); Metzler v. Bear Auto. Serv. Equip. Co., 19 F. Supp. 2d 1345, 1356-58 (S.D. Fla. 1998). Even under this narrow reading, *Eastman Kodak* applies to Microsoft’s tying conduct inasmuch as it involved changes in policy after many of Microsoft’s customers had been locked into previous versions of Windows. See *United States v. Microsoft Corp.*, 84 F. Supp. 2d at 18-19, ¶ 30-36; see also Debra J. Aron & Steven S. Wildman, *Economic Theories of Tying and Foreclosure Applied—and Not Applied—in Microsoft*, ANTITRUST, Fall 1999, at 48, 50-51 (“In a market of ‘old buyers,’ in which the operating system is not a bottleneck, it is possible that bundled pricing could be used profitably to exclude rivals in the tied-good market. . . . The fact that most browser users did not acquire the browsers they are currently using when they purchased their PCs suggests that ‘old buyers’ predominate.”).

897. See *supra* notes 110-13 and accompanying text.

898. See *supra* Part II.B.

899. See *supra* Part IV.B.

900. See *supra* notes 110-13 and accompanying text; see also III AREEDA, *supra* note 112, ¶ 652c, at 89 (noting that a leveraging claim may be based on the use of “monopoly power in [the leveraging market] to place rivals in [the leveraged market] at a competitive disadvantage, perhaps by raising their costs or making their offerings less attractive”).

Jackson's questionable dismissal of the monopoly leveraging claim may therefore have prevented the state plaintiffs from presenting their clearest possible case that Microsoft's tying conduct unreasonably harmed competition in the tied product market.

2. Remedies

The final judgments expressly permitted Microsoft to override a user's choice of a rival Web browser software product whenever Microsoft, in its sole discretion, determines that the rival product's design is inconsistent with Microsoft's own technical approach to supplying Web browsing functionality in Windows.⁹⁰¹ Even though Microsoft was required to add a facility for "enabling or removing access . . . and altering default invocations"⁹⁰² to Microsoft's Web browser software product, the override provision ensures that users cannot truly remove access to Microsoft's browser or choose a different default browser.⁹⁰³ The final judgments therefore served to immunize two of the four specific acts that were challenged under the tying and monopoly leveraging claims.⁹⁰⁴ Microsoft has also

To the extent that Microsoft's tying conduct served to "prevent erosion of the primary monopoly" in the tying product market, one commentator has suggested that § 2 liability may be based on an additional theory of "defensive leveraging." See Robin Cooper Feldman, Essay, *Defensive Leveraging in Antitrust*, 87 GEO. L.J. 2079, 2113-15 (1999). The D.C. Circuit did not explicitly recognize such a theory, but undertook a similar analysis in reviewing the tying conduct under the § 2 monopoly maintenance claim. See *United States v. Microsoft Corp.*, 253 F.3d 34, 64-67 (D.C. Cir. 2001) (holding that "Microsoft's exclusion of IE from the Add/Remove Programs utility and its commingling of browser and operating system code" had the effect of protecting Microsoft's operating system monopoly and were not justified, and therefore constitute exclusionary conduct in violation of § 2).

901. See Second Revised Proposed Final J., *supra* note 418, at § III.H.2 (permitting overriding where a rival product "fails to implement a reasonable technical requirement . . . that is necessary for valid technical reasons to supply the end user with functionality consistent with a Windows Operating System Product"); see also *id.* § VI.U ("The software code that comprises a Windows Operating System Product shall be determined by Microsoft in its sole discretion.").

902. *Id.* at § III.H.1.

903. Cf. *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 52, ¶ 171 (D.D.C. 1999) ("While Windows 98 does provide the user with the ability to choose a different default browser, it does not treat this choice as the 'default browser' within the ordinary meaning of the term.").

Users of future versions of Windows will even be constrained in their ability to choose a different version of Internet Explorer as their default browser. See Richard Morochove, *Why Microsoft Prices May Hinge on Linux Fate*, TORONTO STAR, June 16, 2003, at D2 (quoting Brian Countryman, Microsoft's Internet Explorer program manager, to the effect that "there will be no future standalone installations" of Internet Explorer).

904. See *supra* text accompanying notes 713-15. In the second six-month

continued to enjoy the monopoly power in the market for Web browser software products for Windows 98 that was presumptively attributable to its tying conduct.⁹⁰⁵

If, as the first principles analysis indicates, Microsoft could have been held liable under the tying and monopoly leveraging claims on the facts proven at trial, then actual harms to competition in this market have gone unremedied.⁹⁰⁶ While the tailoring of an appropriate remedy for these antitrust violations would have been largely determined by the litigation postures of the parties and the exercise of Judge Kollar-Kotelly's "broad discretion,"⁹⁰⁷ it is instructive at least to reexamine the five rejected remedy proposals that addressed the inclusion of a Web browser software product in Windows 98:

- (1) Prohibiting Microsoft from conditioning the licensing of Windows on the licensing of any "Microsoft Middleware Product";
- (2) Requiring Microsoft to provide the end user the ability to replace "Microsoft Middleware" with non-Microsoft "Middleware" as "the Default Middleware for any functionality";
- (3) Prohibiting Microsoft from "Bind[ing] any Microsoft Middleware Products to the Windows Operating System [Product]" unless it also offered to license "an otherwise identical version of the Windows Operating System Product that omit[ted] any [requested] combination of Microsoft Middleware Products";
- (4) Requiring Microsoft to "disclose and license all source code for all Browser products and Browser functionality"; and
- (5) Requiring Microsoft to provide advance notice of "any action that it knows, or reasonably should know, will directly or indirectly, interfere with or degrade the performance or

status report on Microsoft's compliance with the final judgments, the parties reported that Microsoft had agreed to discontinue its practice of overriding the user's default browser when the "Shop for Music Online" feature is invoked. Microsoft did not, however, concede that this practice violated the terms of the final judgments. Joint Status Report on Microsoft's Compliance with the Final Judgment (Jan 16, 2004), at 10, *United States v. Microsoft Corp.*, (Civ. No. 98-1232).

905. See *supra* text accompanying notes 801-10.

906. See *supra* text accompanying notes 425-28.

907. *United States v. Microsoft Corp.*, 253 F.3d. 34, 105 (D.C. Cir. 2001).

compatibility of any non-Microsoft Middleware when Interoperating with any Microsoft Platform Software other than for good cause.”⁹⁰⁸

The third and fourth of these proposals do not appear to address the conduct challenged under the tying claim, as that conduct was characterized in light of first principles. Regarding the former, Microsoft’s tying conduct did not involve “bind[ing]” any software to the software accompanying its operating system software product in Windows 98, and Judge Kollar-Kotelly was correct in inferring from Judge Jackson’s findings that the removal of a software product does not necessarily require the removal of the code that accompanies it.⁹⁰⁹ As for the latter, the source code accompanying Microsoft’s Web browser software product is the same as the source code accompanying Microsoft’s operating system software product.⁹¹⁰ While the disclosure of this source code would certainly assist other software developers in allowing users to remove unwanted Microsoft software products and preventing the overriding of desired software products,⁹¹¹ the disclosure remedy was not tailored to those purposes. Instead, the stated purpose of the remedy was to permit Microsoft’s rivals “the freedom to port the Microsoft Browser code to whatever operating system they wish,”⁹¹² and thereby to replicate Microsoft’s detailed implementation of the essential use case for performing Web transactions.⁹¹³ The disclosure remedy is therefore not designed to promote the kind of quality competition that would be expected in a well-functioning market for Web browser software products for Windows 98.⁹¹⁴

The first, second, and fifth proposals come much closer to

908. See *supra* text accompanying notes 441-45; see also note 440 (defining terms).

909. See *supra* text accompanying note 462.

910. See *supra* text accompanying note 535-40.

911. While developing his prototype removal program, Prof. Felten consulted parts of the source code accompanying one version of Windows 95, two versions of Windows 98, and one version of Internet Explorer. Felten Direct Testimony, *supra* note 227, ¶ 9.

912. Plaintiff Litigating States’ Proposed Findings of Fact, *supra* note 425, ¶ 1103.

913. See *id.* ¶ 1106, at 398 (noting that “this transparency of the source code will allow competing companies to . . . adapt their own products to retain compatibility with the dominant browser”).

914. See *generally Antitrust Analysis, supra* note 28, at 40 (defining a “well-functioning” software product market as one in which each software vendor is free to “respond to consumer demand for quality through design innovation . . . [by] choos[ing] the code (which may include platform software) that the system executes in fulfillment of its responsibilities whenever a consumer chooses to use the software product for any of the user purposes for which it is sold”).

remedying Microsoft's tying (and monopoly leveraging) conduct and establishing a well-functioning market for Web browser software products for Windows 98. The first proposal targets the form licenses by which Microsoft bundled the legal rights that constitute Microsoft's operating system software product and "Microsoft Middleware Product[s]."⁹¹⁵ The second proposal ensures that a rival developer will be able to choose at least the "Middleware" that the system executes in fulfillment of its responsibilities whenever a consumer chooses to use the developer's software product as the "Default Middleware" to support a particular functionality, thereby promoting the kind of design freedom that is the hallmark of a well-functioning software product market.⁹¹⁶ The fifth proposal more specifically addresses the quality-restraining effects of Microsoft's overriding conduct⁹¹⁷ by requiring Microsoft to notify other "Middleware" developers of changes to "Microsoft's Platform Software" that will adversely affect the quality of their software products.

In each of these three proposals, the term "Middleware" was intended to include within its scope Web browser software products and other software products that, by supporting the use of their accompanying software as platform software, could present a potential threat to Microsoft's operating systems monopoly.⁹¹⁸ As this Article's first principles analysis has shown, however, the anticompetitive effect of Microsoft's tying conduct on the tied product market is of special concern not because the tied product is "Middleware," but because it is a product that provides access to resources that may confer "immense value" or cause "devastating and irreversible harm,"⁹¹⁹ which is not amenable to lifecycle pricing at the time of purchase,⁹²⁰ and for which "continuing, competitively driven innovations" are expected to have considerable economic significance.⁹²¹ Remedies for Microsoft's tying conduct should therefore not focus on "Middleware," but instead on an abstraction that at least includes Web browser software products and is defined with respect to these latter characteristics. If, informed by first principles, a tying liability analysis ever were to lead to the imposition of such remedies, the precise destination would be for the

915. *See supra* text accompanying note 745.

916. *See supra* note 914.

917. *See supra* text accompanying notes 780-82.

918. *See supra* note 440 (defining "Middleware").

919. *See supra* text accompanying notes 855-57.

920. *See supra* text accompanying note 894.

921. *See supra* note 586 and accompanying text.

parties and the judge to decide;⁹²² but hopefully this Article has sufficiently illuminated the way.

V. CONCLUSION: *MICROSOFT* IN PERSPECTIVE

A. *Microsoft and the Evolution of Tying Doctrine*

Originally, the per se rule against tying reflected the Supreme Court's early belief that "[t]ying agreements serve hardly any purpose beyond the suppression of competition."⁹²³ As the Court explained in *Northern Pacific*,⁹²⁴ tying arrangements

deny competitors free access to the market for the tied product, not because the party imposing the tying requirements has a better product or a lower price but because of his power or leverage in another market. At the same time buyers are forced to forego their free choice between competing products.⁹²⁵

More recent tying doctrine, however, has reflected the courts' view that many apparent tie-ins do not raise the kinds of antitrust concerns expressed in the Court's early tying cases.⁹²⁶ Thus, notwithstanding the *Jefferson Parish* Court's declaration that "[i]t is far too late in the history of our antitrust jurisprudence" to question the per se illegality of certain tying arrangements,⁹²⁷ the per se rule against tying has been undergoing a process of retrenchment for many years. The Areeda treatise explains:

[T]he apparently easy rule of automatic condemnation began to break down *First*, a few courts allowed "business justifications" as affirmative defenses to tie-ins, notwithstanding the language of per se illegality. *Second*, many courts declared that the alleged tying and tied products were really a single product, which then fell entirely outside of tying law. While many of those "single-product" rulings reflected genuine doubt about a product's metaphysical boundaries, many others reflected a belief that antitrust law should remain aloof, either because the arrangement was justified or surely without harmful impact upon the market. *Third*, many courts came to require actual proof of power with respect to the tying product rather than simply inferring it from the existence of the tie. *Fourth*, some courts have taken a

922. See *supra* text accompanying note 907.

923. *Standard Oil Co. v. United States*, 337 U.S. 293, 305-06 (1949).

924. *N. Pac. Ry. v. United States*, 356 U.S. 1 (1958).

925. *Id.* at 6.

926. See IX AREEDA, *supra* note 90, ¶ 1701c2, at 26.

927. *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 9 (1984).

variety of preliminary steps toward requiring plaintiffs to show that the tie could bring the defendant market power in the tied market.⁹²⁸

Using the first principles approach, I have addressed each of the relevant issues that have been introduced into the per se doctrine through this evolutionary process as they relate to the *Microsoft* tying claim. First, I have reviewed Microsoft's business justifications and concluded that they would have been successfully rebutted.⁹²⁹ Second, I have conducted the separate products inquiry under both the standard *Jefferson Parish* "separate demand" test and the more skeptical "plausible benefit" test suggested by the D.C. Circuit in the consent decree case, and I have shown the tying and tied products in Windows 98 to be separate products under both tests.⁹³⁰ I have also addressed potential skepticism about the "metaphysical boundaries" of the tying and tied products by defining each precisely in legal and technological terms, at an appropriate level of abstraction for the separate products inquiry.⁹³¹ Despite possible intuitions to the contrary, neither copyright law nor software technology operates to combine the tying and tied products into a single product.⁹³² Third, I have noted the district court's thorough assessment of market power in the tying product market, which the D.C. Circuit affirmed in its entirety.⁹³³ Finally, I have gone beyond the dollar-volume foreclosure inquiry to examine the actual and potential anticompetitive effects of Microsoft's tying arrangement, and I have shown that the tying arrangement contributed to Microsoft's acquisition of market power in the tied product market.⁹³⁴ In addressing these issues, the first principles approach demonstrates that the anticompetitive harms from the *Microsoft* tying arrangement lie at the heart of the antitrust concerns underlying the per se rule.

In contrast to the approach I have suggested, the D.C. Circuit's abandonment of the per se rule for tying arrangements between platform software and complementary software functionality represented a drastic departure from the ongoing evolutionary process that had previously characterized modern tying doctrine. It was also unwarranted, given that the D.C. Circuit's conclusion that the *Microsoft* tying arrangement was "unlike any the Supreme

928. IX AREEDA, *supra* note 90, ¶ 1701c2, at 26.

929. *See supra* Part IV.G.

930. *See supra* Part IV.D.

931. *See supra* Part IV.A.

932. *See supra* text accompanying notes 534-46.

933. *See supra* Part IV.C.

934. *See supra* Part IV.F.

Court has considered” was based on the fallacious intuition that software products consist of code.⁹³⁵

As I have also shown, Microsoft’s tying liability could have been sustained nonetheless, even under the rule of reason analysis required by the D.C. Circuit.⁹³⁶ Thus, the *Microsoft* case did not present the kind of benign tie-in that has historically occasioned evolutionary shifts in tying doctrine, let alone a drastic one. The D.C. Circuit’s proclamation of a special “platform software” exception to the per se rule against tying in *Microsoft* seems to exemplify Justice Holmes’s aphorism that “[g]reat cases, like hard cases, make bad law.”⁹³⁷

B. *Microsoft and the Judicial Regulation of Software Design*

The *Microsoft* litigation represents just one in an ongoing series of encounters between legal institutions and software designers that was famously referred to in Prof. Lawrence Lessig’s *Code and Other Laws of Cyberspace* as the interaction between “East Coast Code” and “West Coast Code.”⁹³⁸ As Prof. Lessig has pointed out, the government has frequently used law (East Coast Code) to regulate software (West Coast Code) in the furtherance of larger public policy interests.⁹³⁹ In 1992, for example, Congress passed the Audio Home Recording Act,⁹⁴⁰ which sought to protect copyright owners by requiring that digital audio recording devices be compatible with the Serial Copy Management System standard as promulgated by the Department of Commerce.⁹⁴¹ The Communications Assistance for Law Enforcement Act of 1994⁹⁴² required that telephone companies ensure that their facilities are capable of enabling the government to conduct authorized wiretaps⁹⁴³ and called for industry associations and standard-setting organizations to determine the necessary

935. See *supra* text accompanying notes 512-14; see also *supra* text accompanying notes 673-87 (criticizing the rule of reason holding).

936. See *supra* text accompanying notes 866-70.

937. *N. Sec. Co. v. United States*, 193 U.S. 197, 364 (1904) (Holmes, J., dissenting); cf. George L. Priest, Letter to the Editor: *The Dangers of Attack on Microsoft*, WALL ST. J., June 8, 1998, at A23 (citing Holmes’s aphorism and arguing that “the great Microsoft case has made for terrible analysis, both by [former Judge and Netscape counsel Robert] Bork and by the Justice Department”).

938. LAWRENCE LESSIG, *CODE AND OTHER LAWS OF CYBERSPACE* 53 (1999).

939. See *id.*

940. 17 U.S.C. §§ 1001-10 (2000).

941. See *id.* § 1002.

942. 47 U.S.C. §§ 1001-10 (2000).

943. See *id.* § 1002(a).

technical requirements and certify compliance.⁹⁴⁴ More recently, the Federal Communications Commission's "V-chip" regulation aimed to prevent children from viewing unsuitable television programs by requiring that new televisions enable users to block programs automatically "as soon as a program rating packet with the appropriate Content Advisory or MPAA rating level is received."⁹⁴⁵ East Coast Code exerted influence over West Coast Code again in *Microsoft*, where legal claims brought in Washington, D.C. ultimately resulted in the judicial regulation of software design in Washington state.

As long as software enables conduct that disrupts preexisting allocations of legal rights and obligations, legal institutions will continue to be brought into encounters with software designers. What then is to become of the D.C. Circuit's admonition (as informed by the Areeda treatise) that the law should not "put[] judges and juries in the unwelcome position of designing computers"?⁹⁴⁶ I would suggest that this warning against judicial software design is impelled by the same principle that this Article has served to affirm: the full benefits of ongoing software innovation can be achieved only when developers are free to compete in well-functioning markets. Accordingly, where the law calls upon a court to regulate software design, the court should try to state and apply rules of law without also assuming the software developer's role in identifying and prescribing particular design solutions that comply with those rules of law.

In the context of a well-functioning software product market, it is possible for a court to *regulate* software design without *engaging in* software design, simply by stating and applying implementation-neutral legal rules. Implementation-neutral legal rules can change the incentives relating to the use of a software product in such a way as to affect consumer preferences regarding the product's competitive variables.⁹⁴⁷ They can require software products to enable a new function or use, thereby effectively altering the essential use cases that the product must support while posing a new technological problem to be solved by software designers.⁹⁴⁸

944. *See id.* § 1006(a)(1)-(2).

945. *See* 47 C.F.R. § 15.120(e)(1) (2003).

946. *United States v. Microsoft Corp.*, 147 F.3d 935, 950 (D.C. Cir. 1998) (alteration in original) (quoting IX AREEDA, *supra* note 90, ¶ 1700j, at 15).

947. For example, occupational safety and health regulations might elevate the relative importance of preference and performance metrics relating to ergonomics.

948. Two examples are the Communications Assistance for Law Enforcement Act and "V-chip" requirements discussed *supra* text accompanying notes 942-45.

They can even prohibit certain conduct altogether, thereby barring the use of software products for certain purposes.⁹⁴⁹ As long as each software designer has the freedom to choose which code is to be executed when its software product is used, quality competition can take place within the implementation-neutral legal parameters set by the court.

I would therefore describe a court as putting itself into the “unwelcome position of designing computers” whenever it resolves a question of law by prescribing a particular software design solution. Because courts are neither competent in software design nor motivated by quality competition, courts that engage in software design risk not only hampering or foreclosing lawful, quality-enhancing innovations in the relevant software product market,⁹⁵⁰ but prescribing technological solutions that do not even accurately implement the court’s own legal conclusion.

Such judicial difficulties in designing computational methods can be traced back to the dawn of the digital age. In a 1943 case, *Smolowe v. Delendo Corp.*,⁹⁵¹ the Second Circuit interpreted section 16(b) of the Securities Exchange Act of 1934, which requires ten percent owners, directors and officers of a company to disgorge so-called “short-swing profits”; that is, “any profit realized . . . from any purchase and sale, or any sale and purchase, of any equity security” of the company within a six-month period.⁹⁵² Noting the statute’s “failure to specify a method of computation”⁹⁵³ and the lack of any express limitation on the terms “purchase” and “sale,” the court held:

We must suppose that the statute was intended to be thoroughgoing, to squeeze all possible profits out of stock transactions, and thus to establish a standard so high as to prevent any conflict between the selfish interest of a fiduciary officer, director, or stockholder and the faithful performance of

949. For example, the use of peer-to-peer network software products such as Napster to download copyrighted works without authorization may be subject to legal challenge. See *Antitrust Analysis*, *supra* note 28, at 80-82.

950. See, e.g., *Sony Computer Entm’t, Inc. v. Connectix Corp.*, 203 F.3d 596, 605 (9th Cir. 2000) (declining to establish Sony’s proposed criterion for fair use of copyrighted software because, *inter alia*, it “would require that a software engineer, faced with two engineering solutions that each require intermediate copying of protected and unprotected material, often follow the *least efficient solution*”).

951. 136 F.2d 231 (2d Cir. 1943).

952. 15 U.S.C. § 78p(b) (2004); see also 17 C.F.R. § 240.16b-6 (2004) (discussing treatment of derivative securities under the statute).

953. *Smolowe*, 136 F.2d at 237.

his duty.⁹⁵⁴

The court then went beyond stating this rule of law to engaging in software design, by prescribing a computational procedure for matching purchases and sales to produce the maximum possible profit: “The only rule whereby all possible profits can be surely recovered is that of lowest price in, highest price out—within six months—as applied by the district court.”⁹⁵⁵ This procedure is incorrect, inasmuch as it may fail to calculate the maximum possible profit when the transactions “take place over more than six months, or [when] some trades are immunized by the statute of limitations.”⁹⁵⁶ Despite this, the courts have consistently continued to apply the *Smolowe* method.⁹⁵⁷ Neither the recognition of the method’s failings in a 1987 treatise article⁹⁵⁸ nor the publication in 1997 of an accurate method for calculation of short-swing profits⁹⁵⁹ has yet led the courts to alter their erroneous computational approach.⁹⁶⁰ As long as the software design solution prescribed by *Smolowe* continues to be considered good law, alternative methods

954. *Id.* at 239.

955. *Id.*

956. Andrew Chin, *Accurate Calculation of Short-Swing Profits Under Section 16(b) of the Securities Exchange Act of 1934*, 22 DEL. J. CORP. L. 587, 590-91 n.18 (1997); see also Arnold S. Jacobs, *An Analysis of Section 16 of the Securities Exchange Act of 1934*, 32 N.Y.L. SCH. L. REV. 209, 532 (1987).

957. See, e.g., *Gund v. First Fla. Banks, Inc.*, 726 F.2d 682, 688 (11th Cir. 1984) (“Under the *Smolowe* rule, the highest sales price is matched with the lowest purchase price in any given six-month period in order to calculate the recoverable profit.”); *Whittaker v. Whittaker Corp.*, 639 F.2d 516, 530-31 (9th Cir. 1981) (holding that *Smolowe*’s “lowest purchase price, highest sale price method” is the “nearly unanimous” computation method); *Chem. Fund, Inc. v. Xerox Corp.*, 377 F.2d 107, 109 (2d Cir. 1967); *W. Auto Supply Co. v. Gamble-Skogmo, Inc.*, 348 F.2d 736, 742-43 (8th Cir. 1965) (same); *Adler v. Klawans*, 267 F.2d 840, 847 (2d Cir. 1959) (same); *Morales v. Lukens, Inc.*, 593 F. Supp. 1209, 1213 (S.D.N.Y. 1984) (same).

958. See Jacobs, *supra* note 956.

959. See Chin, *supra* note 956.

960. See, e.g., *Segen ex rel. KFx Inc. v. Westcliff Capital Mgmt., LLC*, 299 F. Supp. 2d 262, 272 (S.D.N.Y. 2004) (stating that the *Smolowe* method “maximizes the disgorgeable amount . . . by matching the highest sale prices with the lowest purchase prices within the six month period”); *Dreiling ex rel. Infospace, Inc. v. Jain*, 281 F. Supp. 2d 1234, 1238-39 (W.D. Wash. 2003) (citing “the *Smolowe* rule” and applying the “lowest purchase price, highest sale price method”); *Donoghue v. Natural Microsystems Corp.*, 198 F. Supp. 2d 487, 490-91 (S.D.N.Y. 2002) (“[T]he methodology first announced in *Smolowe* . . . remains in effect as to the matching as transactions.”); *Donoghue v. Miracor Diagnostics, Inc.*, No. 00 CIV 6696 JGK RLE, 2002 WL 233188, at *2 (S.D.N.Y. Feb. 11, 2002) (using *Smolowe* rule to compute recoverable profits); *Morales v. New Valley Corp.*, 999 F. Supp. 470, 476 (S.D.N.Y. 1998) (same).

that would better implement the court's stated rule of calculating the maximum possible profit will be foreclosed.

The outcome of the *Microsoft* remedies proceedings has been similarly problematic. In a well-functioning market, a developer of a "Non-Microsoft Middleware Product" for Windows would have the freedom to choose the code that is executed whenever a consumer chooses to use the product for one of its intended purposes,⁹⁶¹ including by designating it as the user's default choice. In the proceedings between Microsoft and the litigating states, however, Judge Kollar-Kotelly's final judgment expressly reserved to Microsoft the right to require any such product to provide functionality consistent with the *code* that Microsoft in its sole discretion refers to as a "Windows Operating System Product."⁹⁶² Apart from the inaccuracy and confusion inherent in referring to code as a software product, the court's remedial order engaged in software design when it prescribed a particular set of code, embodying Microsoft's particular design and implementation choices, as the standard with which the functionality of a "Non-Microsoft Middleware Product" must be consistent in order to compete on the terms that would prevail in a well-functioning market.

To be fair, these problems with the *Microsoft* remedies were probably unavoidable by the time Judge Kollar-Kotelly heard the case. The government had already decided to drop the tying claim, and the D.C. Circuit had dismissed the attempted monopolization claim with prejudice. There was no surviving allegation of harm to competition involving the functionality of any "Non-Microsoft Middleware Product" (including, for example, Netscape Navigator) and, therefore, no legal basis for restoring that competition to the extent that would prevail in a well-functioning market. Neither the parties nor the previous courts had provided Judge Kollar-Kotelly with a legally and technologically accurate definition of a software product that was sufficiently detailed to obviate the powerful but incorrect intuition that Microsoft's Windows operating system software product consisted of software code. On the basis of that false intuition, the D.C. Circuit had credited Microsoft's justifications for the overriding conduct under the section 2 claim,⁹⁶³ thereby supplying the sole rationale for Judge Kollar-Kotelly's

961. See *supra* text accompanying note 916.

962. See *supra* text accompanying notes 434-35; see also *supra* note 435 (noting the SRPFJ's provision that "[t]he software code that comprises a Windows Operating System Product shall be determined by Microsoft in its sole discretion").

963. See *supra* text accompanying notes 395-98.

rejection of a proposed remedy that would have accorded full respect to a user's default choice.⁹⁶⁴ The ironic result of these failures was that the same Court of Appeals that in 1998 had so pointedly sought to avoid putting judges into the "unwelcome position of designing computers"⁹⁶⁵ ultimately forced Judge Kollar-Kotelly into that very position four years later.

As I have shown,⁹⁶⁶ if the *Microsoft* courts had followed a first principles approach to the analysis of the tying claim at any stage of the litigation (including the remand proceedings, if the government had pursued the claim under the rule of reason), the case could have been resolved without judicial software design. Microsoft would have been held liable for tying conduct that harmed competition in a well-defined market for Web browser software products. While Prof. Felten engaged in software design in producing a proof of concept to show that Microsoft's tying conduct was not necessary to obtain any of the claimed benefits, the legal analysis I have suggested would not have prescribed Prof. Felten's or any other particular design solution as a remedy. To the contrary, by calling for remedies that permit quality competition in the tied market on the terms that would prevail in a well-functioning software product market, the first principles approach would necessarily have precluded any remedies that prescribed any particular software design solution to the problem of Microsoft's tying conduct.⁹⁶⁷

C. *Microsoft and the Enduring Role of Antitrust*

Michael Dertouzos, the late director of Massachusetts Institute of Technology's Laboratory for Computer Science and a onetime expert witness for Microsoft whose deposition was admitted at trial, was a leading advocate of software usability. His final book, *The Unfinished Revolution*,⁹⁶⁸ won praise from Microsoft chairman Bill Gates as "a clear and compelling vision for human-centric computing—for a future in which technology adapts to people, rather than the other way around."⁹⁶⁹ In that book, Dertouzos lamented that during the Microsoft trial, "while we heard a great deal about every conceivable rivaling corporate interest, the far

964. See *supra* text accompanying notes 453-55.

965. See *supra* text accompanying note 156.

966. See *supra* Part IV.

967. For examples of remedies that would have been supported by a first principles analysis, see *supra* text accompanying notes 915-22. It is straightforward to note that none of these remedies prescribes any particular software design approach.

968. MICHAEL L. DERTOUZOS, *THE UNFINISHED REVOLUTION: HUMAN-CENTERED COMPUTERS AND WHAT THEY CAN DO FOR US* (2001).

969. See *id.* Gates's comments appear on the book jacket.

bigger human interest of ease of use was ignored.”⁹⁷⁰ In Dertouzos’s view, “the first step toward human-centric computing” will be the implementation of “natural interaction with machines,” wherein “machine actions [will] match our human intent” and where the system will “let us carry out our intent at our level and with little effort.”⁹⁷¹ While there was considerable controversy during the trial as to Dertouzos’s views on the merits of Microsoft’s browser-operating system combination,⁹⁷² the pursuit of well-functioning software product markets advocated in this Article may be said to advance Dertouzos’s vision of human-centric computing by setting in motion a full and free competition to offer the software product that most satisfactorily enables a system to fulfill its responsibilities in response to a user’s intentions.

During the summer of 1996, while Microsoft was redesigning Windows and Internet Explorer in part for the purpose of reducing the usability of competing Web browsers,⁹⁷³ the *Harvard Journal of Law and Technology* published its symposium issue on “High Technology, Antitrust, and the Regulation of Competition.”⁹⁷⁴ None of the articles in that issue commented on the looming Microsoft-Netscape browser war.⁹⁷⁵ In light of the ensuing confusion in antitrust jurisprudence and scholarship regarding the nature of competition in the software industry,⁹⁷⁶ the symposium may now be seen as providing a rare moment of clarity. In what was to be his last law review article, longtime Brooklyn Law School professor

970. *Id.* at 43.

971. *Id.* at 23-24.

972. The government cited Dertouzos’s deposition testimony that “[h]istorically and today, it is the case that browsers are treated as applications.” Plaintiffs’ Proposed Findings of Fact ¶ 96.4(v). Microsoft, however, pointed to Dertouzos’s testimony that “it is just a matter of time before the mechanisms used by computers to access local and remotely stored information merge, eliminating the distinction between operating systems and Web browsing software.” Microsoft’s Proposed Findings of Fact, *supra* note 17, ¶ 681; *see also* Steve Lohr, *Almost a Microsoft Witness, but Definitely a Hot Potato*, N.Y. TIMES, Apr. 30, 1999, at C8 (describing the controversy over the interpretation of Dertouzos’s testimony).

973. *See* *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9, 50, ¶ 160 (D.D.C. 1999) (“Microsoft set out to bind Internet Explorer more tightly to Windows 95 as a technical matter. The intent was to . . . complicate the experience of using Navigator with Windows 95.”).

974. *See generally* 9 HARV. J.L. & TECH. 237-597 (1996).

975. *But cf.* Mark A. Lemley, *Antitrust and the Internet Standardization Problem*, 28 CONN. L. REV. 1041, 1076-77 (1996) (discussing the “browser battle” between Microsoft and Netscape).

976. *See supra* text accompanying notes 15-27.

Leon E. Wein⁹⁷⁷ presented a manifesto for market-driven innovation in human-centered product design, which was itself a tribute to the late Supreme Court Justice William O. Douglas's call for "ways and means to make the machine . . . the servant of man."⁹⁷⁸ Wein wrote:

[C]ompetition among creative entrepreneurs seeking consumers has long been the engine of innovation. If consumers want ease of use, market mechanisms will spur its design and availability for sale, and human-centered technologies will be assimilated through an inevitable, albeit gradual, process. However, this assertion presumes a process of continual modification that provides consumers with desirable products of ever-greater value and ease of use. In any market, gaps necessarily exist between the demand for humane design, the availability of user-centered technology, and the willingness of entrepreneurs to invest in designs to suit people as well as to perform functions. When the market mechanism is inadequate to the task, the law's role in stimulating anthropocentric design may well be pivotal.⁹⁷⁹

The Justice Department and the D.C. Circuit may have missed their opportunity to repair a vital engine of software innovation, but there will be others.⁹⁸⁰ Contrary to popular rumors,⁹⁸¹ antitrust is

977. See Leon E. Wein, *Maladjusted Contrivances and Clumsy Automation: A Jurisprudential Investigation*, 9 HARV. J.L. & TECH. 375 (1996).

978. WILLIAM O. DOUGLAS, POINTS OF REBELLION 96 (1970).

979. Wein, *supra* note 977, at 384-85.

980. See Lawrence A. Sullivan, *Is Competition Policy Possible in High Tech Markets?: An Inquiry into Antitrust, Intellectual Property, and Broadband Regulation as Applied to "The New Economy"*, 52 CASE W. RES. L. REV. 41, 51-52 (2001) (noting that the D.C. Circuit has declined to immunize Microsoft's future plans to add functionalities to Windows).

981. See, e.g., JEROME CHRISTENSEN, ROMANTICISM AT THE END OF HISTORY 188 (2000) (describing the government's case against Microsoft as a "hopeful anachronism"); KOPEL, *supra* note 24, at 160 ("[T]he Microsoft case is the vanguard of many more information technology cases to come. If the Microsoft case is the best the Antitrust Division has to offer America, then there is nothing of value in the Sherman Act."); Arthur Austin, *Antitrust Reaction to the Merger Wave: The Revolution vs. The Counterrevolution*, 66 N.C. L. REV. 931, 960 (1988) (describing the emergence of technology-oriented firms as a "major critical factor signaling the demise of antitrust"); Mike Rosen, *Microsoft Found Guilty of Success*, ROCKY MTN. NEWS, April 14, 2000, at 47A ("As applied to the dynamic information technology industry, traditional antitrust measures like the Sherman Act of 1890 and the Clayton Act of 1914 are as obsolete as hand-cranked, mechanical adding machines."); see also Jeffrey A. Eisenach, *Foreword to COMPETITION, INNOVATION AND THE MICROSOFT MONOPOLY: ANTITRUST IN THE DIGITAL MARKETPLACE*, at vii (Jeffrey A. Eisenach & Thomas M. Lenard eds., 1999) ("Do the antitrust laws have a place in the digital economy, or are they obsolete, destined to join Soviet-style central planning on the proverbial 'ash heap of history'? That is the question raised by the government's prosecution of

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not obsolete in the digital age. Where market power impedes the pursuit of human-centric computing, antitrust jurisprudence, informed by first principles, can ensure that the path of innovation in software design is determined neither by courts nor monopolists, but by the rule of full and free competition in a well-functioning market.