BETWEEN LOGIC AND EXPERIENCE: ERROR COSTS AND *UNITED STATES V. MICROSOFT CORP.*

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This Article uses *United States v. Microsoft Corp.*[1] to assess the ongoing debate over how antitrust doctrine should deal with the risk of mistakes and the consequent problem of error costs.[2] I discuss the case in the context of the Justice Department's longstanding involvement in general-purpose computing, with an eye to the ways free and open-source software development practices ("F/OSS") may affect the structure of those markets in the future. In particular, I focus on the D.C. Circuit's two-tiered approach to causation with respect to the monopolization cause of action. The Circuit's approach is best understood as a doctrinal tool designed to minimize error costs.

There are two main schools of thought regarding relative error costs. One school, for which Judge Frank Easterbrook has been a consistent and eloquent advocate, holds that society suffers more when courts wrongly find a defendant liable than when they wrongly find no liability.[3] On this view, monopolization cases should be restricted to targeting the few business practices that we understand thoroughly enough to say with confidence that such practices undermine competition. Outside this set of practices, judges should stay the heavy hand of antitrust. A key claim of this school is that markets correct mistakes better than courts do, so I refer to it as the market correction approach. I agree with this view because experience teaches that this approach causes less harm than extensive judicial management of large firms. As I discuss in Part I, however, I concede that,

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1. My nomenclature for the opinions in the case is as follows: United States v. Microsoft Corp., 147 F.3d 935 (D.C. Cir. 1998) [hereinafter *Microsoft I*] (contempt proceeding); United States v. Microsoft Corp., 84 F. Supp. 2d 9 (D.D.C. 1999) [hereinafter *Microsoft II*] (findings of fact); United States v. Microsoft Corp., 87 F. Supp. 2d 30 (D.D.C. 2000) [hereinafter *Microsoft III*] (conclusions of law), *aff'd in part and rev'd in part*, United States v. Microsoft Corp., 253 F.3d 34 (D.C. Cir.) (en banc) [hereinafter *Microsoft IV*] (merits appeal), *cert. denied*, 534 U.S. 952 (2001); New York v. Microsoft Corp., 224 F. Supp. 2d 76 (D.D.C. 2002) [hereinafter *Microsoft V*] (non-settling states remedy); United States v. Microsoft Corp., 231 F. Supp. 2d 144 (D.D.C. 2002) [hereinafter *Microsoft VI*]; (Justice Department settlement approval); Massachusetts v. Microsoft Corp., 373 F.3d 1199 (D.C. Cir. 2004) [hereinafter *Microsoft VII*] (remedy appeal).

2. Error costs are the social costs of mistaken decisions. A false positive error cost occurs when a court wrongly finds liability based on conduct that is actually efficient. A false negative error cost occurs when a court wrongly finds no liability based on conduct that is actually inefficient.

3. *See* Frank H. Easterbrook, *Allocating Antitrust Decisionmaking Tasks*, 76 GEO. L.J. 305 (1987); Frank H. Easterbrook, *Comparative Advantage and Antitrust Law*, 75 CALIF. L. REV. 983 (1987) [hereinafter Easterbrook, *Comparative Advantage*]; Frank H. Easterbrook, *Information and Antitrust*, 2000 U. CHI. LEGAL. F. 1; Frank H. Easterbrook, *On Identifying Exclusionary Conduct*, 61 NOTRE DAME L. REV. 972 (1986); Frank H. Easterbrook, *The Limits of Antitrust*, 63 TEX. L. REV. 1 (1984) [hereinafter Easterbrook, *Limits*].

as a strictly logical matter, the arguments for this view are surprisingly weak.

A second school of thought holds that error costs are simply one aspect of what courts should consider when determining whether conduct is anti-competitive. On this view, error costs should be calculated and then weighed in the balance, along with the costs and benefits to society of the conduct at issue. Uncertainty regarding such costs might cause one to discount the estimated benefits or harms of a practice, or to discount the advantages or disadvantages of a remedy, but it would not cause one to refrain from analysis. Professor Oliver Williamson advanced this view in direct response to Judge Easterbrook's claim.[4] Williamson's view treats the error cost problem as an aspect of decision theory and seeks to integrate the rationality of decision theory with the economic analysis of the case at hand. I therefore refer to Williamson's view as the integration approach to error costs.[5]

The integration approach to error costs requires close judicial scrutiny of specific business practices. The resulting analysis resembles administrative regulation by judges enforcing an unfair practices statute. Analogizing to law enforcement more generally, the integration approach is "traffic cop antitrust," which pursues even minor infractions unlikely to cause significant harm to competition. The market correction approach is "SWAT team antitrust," in which intervention is reserved only for extreme cases and takes a more extreme form. Each approach is logical relative to certain dispositions toward regulation and certain goals for antitrust policy. Neither approach logically dominates the other.

Perfect information could reconcile the two approaches. Data derived from the market correction approach could be used to set the value of variables needed to perform integrationist analysis. Information is imperfect, however, and even the notion of what constitutes a mistake is debatable. Thus, we have disagreements which cannot be explained either by data or by logic.

The error costs debate was central to several articles written shortly after the government filed suit against Microsoft. In 1999, Professors Salop and Romaine published an important defense of the Justice Department's liability theories. They defended an integrationist approach to error costs, arguing in part that the standard of liability for monopolization should re-

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4. Oliver Williamson, *Delimiting Antitrust*, 76 GEO. L.J. 271, 280 (1987).

5. Both approaches to error costs seek to embody their view in doctrine, so it is useful to remember that what is integrated is decision theory and the judicial decision, not a view of error costs and a doctrinal standard.

flect the approach that best minimizes the sum of such costs.[6] Professors Cass and Hylton responded with an article that was skeptical of the government's theories and that defended the market correction approach.[7] Professor Lopatka also argued for the market correction approach in an article discussing *Microsoft* against the background of the Justice Department's 1969 monopolization suit against IBM.[8]

In this Article, I examine the record regarding the most significant monopolization claims in the case, from both the liability and remedy phases of the proceeding, to see what light the end of the case might shed on the error costs arguments made at the beginning. I conclude that the lesson of *United States v. Microsoft Corp.* is that the law should be more averse to false positives (cases finding liability for conduct that is actually welfare-enhancing) than to false negatives (not finding liable conduct that actually reduces welfare). A good way to turn this lesson into doctrine would be to reverse the D.C. Circuit's approach to causation in monopoly maintenance analysis.

I support this thesis by arguing three main points. First, the D.C. Circuit's stated approach to monopolization in *Microsoft* appears consistent with the integration approach to error costs. This fact is seen most easily in the court's four-part test for monopolization liability and in its two-tiered approach to the question of causation. In addition, the lawyers and economists on each side of the case were superb, and the court of appeals' unanimous liability opinion reflected the agreement of some economically sophisticated judges. The case therefore should present a fair test of the integration approach. If the approach did not work in *Microsoft*, something is wrong with it.

Second, the actual analysis in *United States v. Microsoft Corp.* was not as pure an application of the integration approach as one would expect from the D.C. Circuit's stated standard for monopolization liability. In reality, the court balanced little. With respect to several issues, the court engaged in the fine-grained analysis of particular practices one would expect from an integrationist approach, but it did so through relatively categorical statements that seemed better suited to a market correction approach. The tensions between these two approaches and between the court's statement of standards and its application of them explain why the court's opinion so

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6. Steven C. Salop & Craig R. Romaine, *Preserving Monopoly: Economic Analysis, Legal Standards, and Microsoft*, 7 GEO. MASON L. REV. 617, 659 (1999).

7. Ronald A. Cass & Keith N. Hylton, *Preserving Competition: Economic Analysis, Legal Standards and Microsoft*, 8 GEO. MASON L. REV. 1 (1999).

8. John E. Lopatka, United States v. IBM*: A Monument to Arrogance*, 68 ANTITRUST L.J. 145 (2000).

often seems confused or contradictory. The net result is a sort of hybrid "third way" that appears quite logical at each step, but, like a badly executed pointillist painting, produces an unsatisfactory overall effect.

Finally, as a matter of experience rather than logic, the *Microsoft* litigation provides more support for the market correction approach to error costs than for the integration approach. The case produced a peculiar mishmash of liability and remedies, in which the acts that did the most to reinforce Microsoft's market power were found lawful while the acts found unlawful were effectively trivial. The net result was a tepid tapioca pudding of a consent decree, which almost certainly will do nothing to reduce Microsoft's market power.[9]

At the end of the day, therefore, *United States v. Microsoft Corp.* offers two lessons relative to the error cost debate. The first lesson is that a court should make a choice on the issue. Courts should either engage in the detailed balancing of costs and benefits implied by the integration approach or refuse to impose liability based on ambiguous conduct or conduct that is unlikely to preserve market power, even if the costs of that particular conduct exceed the benefits.

Even if commentators can agree that courts should get off the fence on the error cost issue, of course, there is widespread disagreement as to which way the courts should jump. The second lesson, therefore, is more controversial: *United States v. Microsoft Corp.* supports the view that experience should trump logic where the two conflict. The muddled result in *Microsoft* is consistent with the government's overall record in policing predatory conduct in markets related to general-purpose computing. The record inspires little confidence that antitrust litigation in this market has made us better off.

I.   THE ERROR COST DEBATE AND APPLYING *UNITED STATES V. MICROSOFT CORP.* TO THE DEBATE

A.   The Market Correction Approach

The market correction approach to error costs claims that mistaken condemnation of competitive conduct is costlier than mistaken acquittals of anticompetitive conduct. Starting with an influential article published

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9. I believe this result is good because the case should not have been brought in the first place. I concede that it is perfectly logical to go precisely the other way, however, and to regret that the court of appeals acquitted Microsoft of so much and that the remedy is not stronger.

twenty years ago, Judge (then-Professor) Easterbrook advanced three rea-
sons to accept this claim.

First, most forms of cooperation are efficient, so a judge who refuses
to condemn an ambiguous practice is more likely to be right than wrong.[10]
Professors Hylton and Salinger extended this point with regard to tying
claims, arguing that if most instances of a practice are lawful, then legal
review of such practices will enhance welfare only if the standard of re-
view has an extremely low probability of error.[11]

Second, markets are self-correcting, but bad precedents are not. Mo-
nopoly power implies supra-competitive profits that, over time, will attract
entry that erodes monopoly power.[12] Society may lose in the interim, but it
will not lose forever. Mistaken condemnation of a firm's conduct, how-
ever, creates precedent that deters other firms from engaging in competi-
tive behavior. Precedent thus creates efficiency losses that ripple through
the economy.

Judge Easterbrook's key point here is that judges do not fix bad prece-
dents as surely and as quickly as markets fix (unlawful) market power.
Bad precedent does not induce the entry of good precedent, which only
judges can provide. Judges are either unlikely to do so (because they like
following precedent, which lowers the cost of thinking about new cases)
or unable to do so (because they are bound by a superior tribunal or be-
cause as a panel they cannot reverse precedent and have to try to invoke
the en banc process). Because "mistakes of *law* are not subject to competi-
tive pressures,"[13] condemned practices are likely to stay condemned, even
if there is good reason to believe they are actually efficient.

Judge Easterbrook's final argument is that the cost of monopoly
wrongly permitted is likely to be smaller than the cost of efficient conduct
wrongly condemned. Monopoly's true evil is the deadweight loss that af-
fects only a portion of the demand curve, while efficient conduct may (for
example) lower the production cost of every single unit.[14]

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10. Easterbrook, *Limits*, *supra* note 3, at 15. Judge Easterbrook casts this point in
terms of cooperative practices, but his general skepticism of claims of predatory conduct
justifies expanding the claim to business practices more generally.

11. Keith N. Hylton & Michael Salinger, *Tying Law and Policy: A Decision-
Theoretic Approach*, 69 ANTITRUST L.J. 469 (2001). As Professors Hylton and Salinger
put it, "given the ubiquity of beneficial tying, a rational legal rule must have virtually no
risk of a false conviction." *Id.* at 502.

12. Easterbrook, *Limits*, *supra* note 3, at 15.

13. Easterbrook, *Comparative Advantage*, *supra* note 3, at 986.

14. Easterbrook, *Limits*, *supra* note 3, at 15-16.

In addition to Judge Easterbrook's points, Professors Cass and Hylton argue that false positives in antitrust litigation produce an undesirable culture of economic political correctness in which firms are rewarded for whining to courts rather than for competing on price or quality. They also claim false positives are costlier than false negatives in dynamic markets where technological change facilitates entry, thus reducing the costs of a false negative.[15]

These are powerful but not irrefutable arguments. I am persuaded that they state the best view, but candor compels a survey of their weak spots. To begin, suppose it is true that most business practices that survive competition for any length of time are efficient. That hypothesis justifies the sort of filters Judge Easterbrook recommends, such as requiring a showing of a high degree of market power as a necessary element to most antitrust violations.

Once relatively few of these filters are in place, however, there is no need to take the set of all business practices as the baseline for measuring the probability of a mistaken decision. There is no reason to believe that tying arrangements are as likely to be efficient when the defendant has substantial power in the tying product market, and the tie might deter entry into the tied product market, for example, as they are in the general run of bundling arrangements.[16] That does not mean tying is ever *likely* to harm competition, of course, but it introduces uncertainty into the baseline probability, which means the argument suffers to some degree from the uncertainty to which it is presented as a solution.

Judge Easterbrook's timing argument also overstates his case. Markets do tend to erode monopoly market power in the long run, but that fact does not establish that they erode market power faster than a combination of market forces plus legal prohibitions on anticompetitive conduct. The ripple effect of errors cuts both ways. Condemning efficient practices in one case deters efficient conduct in the market as a whole, but allowing inefficient conduct in one case invites such conduct in the market as a whole. And if the inefficient conduct produces market power, firms will have every incentive to engage in such conduct, producing wasteful competition for monopoly rents, a point Judge Easterbrook recognizes but does not attempt to incorporate in his analysis.[17]

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15. Cass & Hylton, *supra* note 7, at 31-33.

16. *E.g.*, Michael D. Whinston, *Tying, Foreclosure, and Exclusion*, 80 AM. ECON. REV. 837 (1990).

17. Easterbrook, *Limits*, *supra* note 3, at 16 n.31.

Nor is it entirely clear that judges are slower to reverse bad precedent than markets are to erode market power. History provides an imperfect test of the claim, because views on what amounts to a "bad" decision have shifted over time. If one wants to protect small dealers, then cases like *Brown Shoe*[18] and *Image Technical Services*[19] are not obviously wrong, though they either impede or do nothing to advance welfare.[20] It is not fair to use efficiency to condemn a process that aims at something else.

Second, though there is evidence of inefficient precedents lasting a long time,[21] there is also evidence that judges neutralize or reverse bad precedents in a reasonable period of time once the judges settle on a policy goal to pursue. As a general matter, if judges never corrected "mistakes," it would make no sense to talk of a Chicago revolution. As a particular matter, consider some examples. *Brown Shoe* was decided in 1962, and *General Dynamics* in 1974.[22] *Arnold Schwinn* was decided in 1968,[23] and *GTE Sylvania* in 1977.[24] A twelve-year or nine-year interval might seem

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18. Brown Shoe Co. v. United States, 370 U.S. 294 (1962) (holding unlawful merger part of which involved forward integration of shoe manufacturer into retail distribution of its shoes).

19. Eastman Kodak Co. v. Image Technical Servs., 504 U.S. 451 (1992) (allowing plaintiff to proceed on claim that copier manufacturer tied the provision of service for its machines to the purchase of parts for its machines).

20. The same might be said of *Albrecht v. Herald-Tribune Co.*, 390 U.S. 145 (1968), a bad decision that lasted twenty-nine years, until *State Oil v. Khan*, 522 U.S. 3 (1997). The late 1960s were merciless on efficiency-based antitrust, but at that time the Court still took seriously the notion that, to borrow from Justice Harlan's dissent in *Albrecht*, "one of the objectives of the Sherman Act was to preserve, for social rather than economic reasons, a high degree of independence, multiplicity, and variety in the economic system." 390 U.S. at 158 (Harlan, J., dissenting). On the demise of *Albrecht*, see Roger D. Blair & John E. Lopatka, Albrecht *Overruled—At Last*, 66 ANTITRUST L.J. 537 (1998).

21. *E.g.*, Dr. Miles Med. Co. v. John D. Park & Sons Co., 220 U.S. 373 (1911) (declaring minimum resale price maintenance unlawful *per se*).

22. United States v. Gen. Dynamics Corp., 415 U.S. 486 (1974) (reviewing merger under effectively more lenient, efficiency-friendly approach than had been employed in *Brown Shoe*).

23. United States v. Arnold Schwinn & Co., 388 U.S. 365 (1968) (holding unlawful *per se* manufacturer's imposition of vertical nonprice restraints).

24. Continental TV, Inc. v. GTE Sylvania, Inc., 433 U.S. 36 (1977) (holding that vertical nonprice restraints should be reviewed under the rule of reason). Alan Meese points out that in reversing bad precedents courts generally leave open the possibility that a practice might be reviewed under the rule of reason, rather than declaring the practice *per se* lawful. *See* Alan J. Meese, *Intrabrand Restraints and the Theory of the Firm*, 83 N.C. L. REV. 5, 10 (2004) (arguing for rule of *per se* legality for intrabrand restraints). This point is true, though rule of reason analysis, with its market power requirement, *e.g.*, E. Food Servs., Inc. v. Pontifical Catholic Univ. Servs. Ass'n, 357 F.3d 1, 5 (1st Cir.

like an eternity to a firm pinched by precedent, but these are not intolerably long times for a bad decision to be discarded, especially when one considers that *Brown Shoe* was probably more faithful to Congress's intentions than the cases that came after it. *Eastman Kodak Co. v. Image Technical Services* was (in my opinion) a bad decision, but lower court opinions have essentially gutted it, proving that errors might not be very costly even when they are not reversed.[25]

Just as there are examples of relatively fast judicial turnabouts, there are examples of firms maintaining dominant positions for a long time. Microsoft has held its operating systems (OS) monopoly about as long as *Arnold Schwinn* was good law, and the company looks set to maintain that position for at least a while longer. One could reply, as I would, that where monopoly power is durable it is likely because of economic conditions the law cannot and should not try to remedy.[26] On this view, durable market power does not contradict the market correction thesis, because antitrust law cannot change the underlying economic facts and therefore should not try to change market positions dictated by those facts. This argument confirms the market correction view by suggesting that the market will have to undo the power by introducing new technologies that leapfrog the old. This is a cogent argument, and I believe a right one, but it is a long way from "proving" anything.

Third, antitrust law is essentially common law, and the claim that bad antitrust precedents persist runs into the claim that common-law adjudication tends toward efficient rules.[27] Firms seeking to maximize profits will bump up against inefficient decisions, which will come under renewed scrutiny as parties litigate in an effort to clear the judicial barrier to profit. It would of course be better if the barrier were not there in the first place, but one can see how market competition would put pressure on inefficient

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2004), weeds out so many cases that the practical rule, though not the doctrine, approximates *per se* legality.

25. *E.g.*, Herbert Hovenkamp, *Post-Chicago Antitrust: A Review and Critique*, 2001 COLUM. BUS. L. REV. 257, 283-99. Cases include PSI Repair Servs., Inc. v. Honeywell, Inc., 104 F.3d 811 (6th Cir.), *cert denied*, 520 U.S. 1265 (1997); Digital Equip. Corp. v. Uniq Digital Techs., 73 F.3d 756 (7th Cir. 1996); SMS Sys. Maint. Serv. v. Digital Equip. Corp., 11 F. Supp. 2d 166 (D. Mass. 1998), *aff'd*, 188 F.3d 11 (1st Cir. 1999), *cert denied*, 528 U.S. 1188 (2000).

26. The large net economies of scale in operating system software are an example.

27. The notion that antitrust adjudication is essentially common law is discussed in many places, including David McGowan, *Innovation, Uncertainty, and Stability in Antitrust Law*, 16 BERKELEY TECH. L.J. 729, 752-54 (2001). The common-law nature of antitrust is linked to the thesis that the common law tends to efficiency in Blair & Lopatka, *supra* note 20, at 549-54.

precedents. One can think of counter-examples, of course,[28] but a long-standing inefficient precedent may be one that does not significantly impede efficient conduct. If transaction costs are low, for example, then at least with respect to vertical conduct the Coase Theorem implies that firms will be able to work around even inefficient rules, a result the Court alluded to when overruling *Albrecht*.[29] Either way, history does not justify the categorical claim that judges cannot correct or ameliorate error.

Nor can we take for granted that monopolistic activity creates losses across only a portion of the demand curve while foregone efficiencies affect the full range of production. Suppose a court can determine that a dominant firm's anticompetitive acts deter entry by a technology that is superior on the merits to an incumbent technology, or that such acts fragment the technology so that it fails to generate the positive feedback that protects the incumbent. In that case all users of the incumbent's products would be stuck with inferior technology, and losses represented by the difference in utility between the incumbent and the entrant would extend across the full range of demand.

This last point also applies to the claim that in dynamic markets, entry is likely to erode market power rapidly. Technology changes rapidly in computers, but first IBM and now Microsoft have held fairly stable market positions for relatively long periods of time. The minicomputer industry (DEC and Data General) provides a possible counter-example to this history of stability, but the history of market power persisting during periods of rapid innovation contradicts any claim that such innovation necessarily undermines market power. (That history also may suggest that such power is not socially harmful.) I agree emphatically with Professors Cass and Hylton that overly aggressive antitrust liability rules give firms an incentive to whine rather than compete, but one must acknowledge that a too-lenient liability standard might reduce welfare by, for example, deterring entry by firms that would compete if the antitrust laws more closely policed the responsive conduct of incumbent monopolists such as Microsoft.[30]

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28. *See supra* note 20.

29. State Oil v. Khan, 522 U.S. 3, 18 (1997) ("[M]anufacturers and suppliers appear to have fashioned schemes to get around the *per se* rule against vertical maximum price fixing."). That transaction costs are low does not mean they are absent, so it would still be better to have a sensible rule than to force (many) parties to incur (even small) costs to contract around the inefficient precedent.

30. Logically possible, even though a long history of entry, incumbent responses, and more entry, casts serious doubt on whether the logic produces a sound rather than

B.   The Integration Approach

The integration approach to error costs is the main competitor to the market correction approach. The integration approach views error costs as simply one variable to be included in the analysis of a particular case. On this view, a court should not resort to categorical presumptions about error costs or particular types of conduct. The court should instead analyze an allegedly anticompetitive practice on the merits, including in this analysis an analysis of the risk and magnitude of errors one way or another.

Responding to Judge Easterbrook, Professor Williamson defended this approach as a "legal process" analysis, which he distinguished from the "legal rules" approach he attributed to Judge Easterbrook. Professor Williamson felt the legal rules approach was too sure of itself and too unwilling to take into account new learning about the potential anticompetitive effects of strategic behavior. There might be limits on the theories courts could handle, he agreed, but these were not fixed. Over time the law might improve its understanding of strategic behavior, allowing judges to review conduct they previously left alone, and presumably enhance efficiency. As Professor Williamson described it,

> The approach to antitrust and economic regulation proposed herein recommends that administrability considerations be factored into the overall rationality analysis of the issues. The rules in force at each point in time would thus be required to pass an administrability test, but provision would be made to successively improve the rules upon refining the relevant theory and out understanding of complex phenomena. Rationality and the needs of the legal process are thereby joined.[31]

Moreover, in a footnote to this paragraph, Professor Williamson cited an article by Professors Michael Katz and Carl Shapiro that discusses principles that played an important role in the *Microsoft* litigation.[32] In part for this reason, *United States v. Microsoft Corp.* offers a fair test of the ap-

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merely a valid argument. *See* F.M. Scherer, *Antitrust, Efficiency, and Progress*, 62 N.Y.U. L. REV. 998, 1017 (1997).

    31. Williamson, *supra* note 4, at 280 (footnote omitted).

    32. *Id.* at 280 n.38 (citing Michael Katz & Carl Shapiro, *Technology Adoption in the Presence of Network Externalities*, 94 J. POL. ECON. 822, 835, 840 (1986)). Briefly, Professors Katz and Shapiro discuss the risk that in network markets there may be too little standardization or too much (lock-in), that standardization might happen too quickly or too slowly, and that a firm holding intellectual property rights in a standard might sponsor optimal standardization (relative to open competition among standards) or suboptimal standardization.

proach Professor Williamson advocated. I will return to this point in Part III.

In context, Professor Williamson's message to Judge Easterbrook was clear. Just as there should be no "ratchet" in antitrust doctrine,[33] there should be no ratchet in antirust economics. It would be at best churlish, and at worst an admission that the Chicago School was more about ideology than efficiency, to declare that economics was useful (or even mostly useful) when it helped defendants but not when it helped private plaintiffs or the Department of Justice. As a matter of logic and economic theory, one has to concede that Professor Williamson was right, and that his not-so-implied charge was a serious one.

A little over ten years later, Professors Salop and Romaine advanced a similar argument. They maintained that error cost analysis should be understood with regard to decision theory in general, and that the risk and magnitude of error should be integrated into, and therefore expressed by, the standard of liability. If the expected net harm of false condemnation exceeds the expected net harm of false acquittal, then the liability standard should tilt against a finding of liability, and vice versa.[34] Parties would fight about error costs as they fight about everything else, and trial courts would make findings on those issues that would influence their ultimate liability decisions.[35]

This approach led Professors Salop and Romaine to endorse what they called the "unnecessarily restrictive conduct" test for monopolization liability. Under this test, courts weigh conflicting arguments regarding the motives and effect of a practice in order to determine the primary effect of the practice on consumers.[36] Salop and Romaine faulted alternative tests for being too one-sided to take into account all the relevant economic effects and the risks of both false positive and false negative decisions.[37] As

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33. *Cf.* Frank H. Easterbrook, *Is There a Ratchet in Antitrust Law?*, 60 TEX. L. REV. 705 (1982).

34. Salop & Romaine, *supra* note 6. Professors Salop and Romaine say the standard should tilt "marginally" one way or the other. *Id.* at 654. Ideally the degree of bias in the standard would offset precisely the expected cost of error, but there is no way to know any of these magnitudes with any certainty, and no real way to convert the analysis of models into a general standard expressed in English.

35. *Id.* at 655.

36. *Id.* at 659.

37. Salop and Romaine identified these tests as 1) the "avoidable exclusionary conduct" test, which condemned conduct that had an exclusionary effect, regardless of its benefits, so long as the conduct could be avoided, and 2) the "sole purpose and effect" test, which refuses to condemn conduct for which there is any efficiency justification, even if the harms from the conduct outweigh the benefits. *Id.*

we will see in a moment, the D.C. Circuit's *Microsoft* opinion essentially adopts this view in its standard of liability for monopolization.

C.   Assessing the Approaches

Arguing about error costs is a time-honored way of dealing with uncertainty. If you cannot actually demonstrate that your thesis is correct, you can always fall back to the position that it would be better to err in your favor than to err the other way. Because the debate concerns what we should do when we do not know what to do, it is no surprise that it is inconclusive.

Perhaps predictably, disputants sometimes conduct the error-cost debate by arguing about the burden of proof (arguments about error costs in the error-cost debate presumably being too obviously circular). Thus Professor Williamson, who is to a degree sympathetic with Judge Easterbrook's concern over error costs, argues that "no one has provided a demonstration that the cost differences are as Easterbrook indicates. Easterbrook has an undischarged burden of proof that the cost of false positives in the market power region where strategic behavior is implicated is similarly low."[38]

It is true that no one has proved that the market correction approach to error costs is correct. It is also true that no one has proved it incorrect, or that anyone has proved that the integration approach works better in practice. Nor is it clear where the undischarged burden of proof comes from, unless it is just the ordinary burden facing anyone asserting any proposition, in which case one could say that the integration approach has an undischarged burden of showing that it works as well in practice as it does in logic.[39] Even to the extent one relies on experience to bolster one's position, as I do here, there is always the problem (familiar from Hume and Popper) that we cannot prove that past will be prologue, we can only falsify.

Having said all that, as a purely logical matter the integration approach is obviously correct. In fact, it is hard to see why there should be a difference between the two approaches. If and to the extent the facts asserted in favor of the market correction approach are true, then it should be possible to estimate the expected cost of error those facts imply. That estimate could then be plugged into a standard cost-benefit analysis of a case as a whole, including the characteristics of the institution in which it is liti-

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38. Williamson, *supra* note 4, at 289.

39. Professor Lopatka rightly says that it is hard to see how one could *prove* that the market correction approach is best. Lopatka, *supra* note 8, at 151. The same is true of the integration approach.

gated, which is the aim of the integration approach. If that analysis were performed properly, and if all else is equal, the two approaches should produce the same results. On the other hand, if information is poor across the board, so there is no evidentiary basis for favoring the market correction approach, it might be impossible to implement the integration approach. But even then the two approaches would not conflict; instead, they both would simply fail.

There is a conflict between the approaches, however, and it is significant. The balancing that the integration approach favors implies that judges will intrude more into business practices and decisions than they would if they adopted the relatively categorical risk aversion of the market correction approach. The integration approach implies traffic cop antitrust, while the market correction approach implies SWAT team antitrust. If one has faith in governmental regulation and believes judges or enforcement officials can do a good job of balancing the costs and benefits of business conduct, the integration approach will seem obviously correct. If one is skeptical of governmental regulation and the precision of cost-benefit analysis, the market correction approach will seem a wise judgment amply backed up by experience.

This debate will never end. Neither is it completely indeterminate, however. The competing views can be tested in light of actual litigation experience. *United States v. Microsoft Corp.* provides a good test case because the standard for liability the D.C. Circuit articulated in *Microsoft* is similar to the unnecessarily restrictive conduct test Professors Salop and Romaine advocated as integrating error cost analysis with economic analysis and with antitrust doctrine.

Under the D.C. Circuit's test, a defendant is liable only for acts that harm the competitive process itself, rather than acts that merely harm competitors. If a plaintiff makes out a prima facie case that the defendant has harmed competition, the defendant may rebut that case by advancing a "nonpretextual" claim that its conduct is in fact a form of competition on the merits, meaning that its conduct has efficiency benefits. The plaintiff then bears the burden of either rebutting this justification—which leaves the plaintiff's original case standing—or showing "that the anticompetitive harm of the conduct outweighs the procompetitive benefit."[40] The weigh-

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40. *Microsoft IV*, 253 F.3d 34, 58-59 (D.C. Cir. 2001). Although in this portion of the opinion the court said that a plaintiff might either rebut a justification or show that the harms of a practice outweighed the benefits, the court later said that "the plaintiff bears the burden not only of rebutting a proffered justification but also of demonstrating that the anticompetitive effect of the challenged action outweighs it." *Id.* at 67. These two

ing aspect of the D.C. Circuit's test, which the court saw as a rule of rea-
son inquiry, tracks the balancing of Professor Salop and Romaine's test.[41]
The back-and-forth between the prima facie case, justification of conduct,
and rebuttal of that justification may be seen as a way of reducing error
costs by testing in detail claims of both harms and benefits to competition.

In addition, the Justice Department's case in *United States v. Microsoft
Corp.* rested upon a highly sophisticated and logically rigorous economic
analysis. The government's economics experts included Professor Frank-
lin Fisher, who had worked for IBM against the government in the 1970s,
and Professor Carl Shapiro, who did path-breaking work in the analysis of
network markets. David Boies tried the case for the government, and the
non-settling states hired Williams & Connolly, one of the very best litiga-
tion firms in the country, to pursue the remedies they sought. Professor
Mark Lemley advised the government on antitrust and intellectual prop-
erty issues. Thus, one could not ask for a better team to present any theory,
including the post-Chicago theories underlying the government's case. If
an approach performs poorly with such a team behind it, there is reason to
question the approach itself.

United States v. Microsoft Corp. is not a perfect case for testing the
competing approaches, however. As I noted at the outset, and discuss in
some detail in Part III, the court's balancing test did not produce much
balancing. The opinion provides a messy, hybrid, hair-splitting analysis
that, I suspect, satisfies no one, and rightly so. Rather than interpreting this
fact as a reason to ignore the case, however, I treat it as a test of whether
the logical elegance of the integration approach can survive the messy un-
certainties of real-world litigation. *United States v. Microsoft Corp.* sug-
gests that it cannot.

This is a relatively strong claim. Because it argues for the triumph of
experience over logic, I begin my argument by placing *United States v.
Microsoft Corp.* in the long and unhappy context of the Justice Depart-
ment's antitrust involvement in general purpose computing. I examine that
history in the next Part, and turn to key aspects of the *Microsoft* litigation
in Part III.

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formulations may amount to the same thing. A plaintiff who has shown genuine harm and
also rebutted a proffered justification probably will have shown net competitive harm.

41. *Id.* (contradicting Professors Cass and Hylton's view of the appropriate stan-
dard).

II.   BRIEF HISTORY OF APPLYING ANTITRUST ANALYSIS TO COMPUTER AND COMPUTER SOFTWARE MARKETS

Computer and computer software markets have troubled antitrust analysis for decades. Innovation is rapid in such markets, as is the need for close integration of complementary technologies. Fixed costs are high, and most of them must be sunk before production begins, while variable costs can be low (especially for software), so economies of scale on both the supply and demand side (network effects) can be large.

Historically, these factors often have combined to produce markets dominated by a single firm. Antitrust ideology and economic understanding have changed significantly over time, but judges and government enforcers have always viewed such markets with suspicion. That suspicion has led to almost continuous antitrust challenges to the dominant firm by the Justice Department and private plaintiffs. As this Part shows, there is no particular reason to believe this history has made society better off. (It has amortized the debts of generations of law students, but that is a different thing.)

This Part discusses the government's history with regard to IBM and AT&T. It also discusses the relationship between the AT&T history and the growth of F/OSS development and production practices. We do not know yet whether those practices will play an important role in antirust litigation in markets related to general-purpose computing. F/OSS development made an appearance in the *Microsoft* remedy proceedings, however, and it may be relevant to future cases as well. I discuss its history here, and its relation to the *Microsoft* litigation in Part III. The history shows that theories of liability are very similar over time; that litigation tends to lag market developments that call those theories into question; that unintended consequences are likely but hard to assess; and that there is no reason to think we are better off because of these cases than we would be had they not been brought.

A.   IBM

The Justice Department has sued IBM three times. It first attacked IBM's policy of requiring that firms that leased IBM's tabulating hardware also purchase its punchcards. That policy easily can be defended on efficiency grounds: it allowed IBM to discriminate in price between high-volume and low-volume users of its machines. Firms had leased machines and sold cards from the time tabulation machines entered the market, before IBM was even founded, which is good evidence that the practice was

efficient.[42] Nevertheless, the government alleged that IBM tied the sale of its cards to the lease of its machines, and it won the case, which concluded in 1936.[43]

IBM continued its policy of leasing tabulating machines, and the Justice Department attacked that policy directly in a suit filed in 1952. Unfortunately, the government's timing was poor. Two years earlier, IBM's old punch-card rival Remington-Rand had introduced a fully electronic computer. IBM, which the government attacked as an entrenched monopolist, was about to enter a period of robust competition in which it would, for a time, play catch-up. The government's leasing suit settled in 1956 with a consent decree requiring IBM to sell machines as well as lease them. The decree also covered the emerging computer market.[44] In 1994, IBM moved to terminate the decree. The government eventually agreed to terminate the decree over time, and termination was approved in 1998.[45]

The government filed its third suit in 1969. It alleged that IBM had monopolized the market for general-purpose computers—the market the government had not seen coming in 1952. The third case dragged on until 1982, when the Justice Department, led by Assistant Attorney General William Baxter, moved to dismiss it as having no merit.[46] From an administrative point of view, the suit was a Dickensian nightmare.[47] Judge Bork memorably called it the Justice Department's Vietnam.[48]

A particularly important feature of this history is that the Justice Department never could keep up with the market. The Justice Department went after tabulating machines the year after general purpose computers were introduced, and it doggedly pursued IBM through a period in which the fundamental structure of competition changed. For most of the history of general purpose computing, the dominant firm was vertically inte-

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42. PETER SALUS, A QUARTER CENTURY OF UNIX 15 (1994).

43. IBM Corp. v. United States, 298 U.S. 131 (1936).

44. United States v. IBM Corp., 1956 Trade Cas. (CCH) ¶ 68,245 (S.D.N.Y. 1956).

45. United States v. IBM Corp., 163 F.3d 737 (2d Cir. 1998).

46. *In re* IBM Corp., 687 F.2d 591 (2d Cir. 1982).

47. Lopatka, *supra* note 8, at 145. The statistics include, as Professor Lopatka puts it, "700 trial days over the course of nearly seven years, preceded by six years of discovery; 87 live witnesses; 860 deposition witnesses (whose testimony was read aloud to an empty bench, a process that consumed 70 trial days); 104,400 trial transcript pages; 17,000 exhibits." *Id.* at 145.

48. ROBERT H. BORK, THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF 432 (Rev. ed. 1993).

grated.[49] IBM's series 360 and 370 machines, featuring IBM processors, operating systems, applications, and storage devices, competed with those of firms such as Sperry Univac and DEC. IBM responded to firms that sought to make IBM-compatible peripheral devices, such as disk drives, in part by integrating its own make of those devices into its machines.[50]

Things began to change in the 1970s. In the mid-1970s several firms introduced microcomputers, most notably Apple with its Apple II. Production in this market was modular, not integrated.[51] One firm made a chip, another wrote an operating system for it (such as Microsoft's initial product, Altair BASIC), and a third provided memory. One of these firms, or even the user herself, could put the pieces together. Competition shifted from a horizontal interface, in which firms sought to plug into a vertically integrated proprietary system, to a vertical interface, in which different firms sought to plug into the layers above and below them.[52] IBM was a relatively late entrant into this market, and it hastened its entry by adapting to the modular production model that already characterized this market, rather than the integrated, proprietary model the company had pursued in the past.[53]

The Justice Department fell on its sword in the 1969 monopolization case just as developments began to occur that ultimately led to Microsoft displacing IBM in many software markets. Microsoft became an operating system vendor for IBM's personal computer by purchasing from Seattle Computer a program called QDOS (Quick and Dirty Operating System), which it modified into MS-DOS.[54] Microsoft priced MS-DOS aggres-

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49. *See, e.g.*, Joseph Farrell & Philip J. Weiser, *Modularity, Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age*, 17 HARV. J.L. & TECH. 85, 92 (2003).

50. That integration was the basis of part of the *Telex* litigation and later of the government's monopolization case. *See* Cal. Computer Prods., Inc. v. IBM Corp., 613 F.2d 727 (9th Cir. 1979); Innovation Data Processing, Inc. v. IBM Corp., 585 F. Supp. 1470, 1476 (D.N.J. 1984); ILC Peripherals Leasing Corp. v. IBM Corp., 448 F. Supp. 228, 233 (N.D. Cal. 1978), *aff'd per curiam sub nom.* Memorex Corp. v. IBM Corp., 636 F.2d 1188 (9th Cir.1980); Telex Corp. v. IBM Corp., 367 F. Supp. 258, 347 (N.D. Okla. 1973), *aff'd in relevant part*, 510 F.2d 894 (10th Cir. 1975).

51. *See* Richard N. Langlois, *External Economies and Economic Progress: The Case of the Microcomputer Industry*, 66 BUS. HIST. REV. 1, 9-18 (1992).

52. *See, e.g.*, Timothy F. Bresnahan & Shane Greenstein, *Technological Competition and the Structure of the Computer Industry*, 47 J. INDUS. ECON. 1, 1-2 (1999).

53. *Id.* at 20-23.

54. In connection with its reversal of the district court's order breaking Microsoft into an applications firm and an operating system firm, the D.C. Circuit emphasized that, unlike other firms that had been broken up through antitrust consent decrees, Microsoft had grown internally rather than through corporate acquisitions. *Microsoft IV*, 253 F.3d

sively, and most purchasers of the IBM PC chose the MS-DOS operating system. By the early 1990s, Microsoft was the dominant platform firm in the personal computer market.

It may not be fair to judge the Justice Department's IBM experience from an efficiency point of view. The Department was involved with IBM from 1952 continuously (if one counts the 1956 consent decree) through 1998, and antitrust theory and doctrine changed quite a bit during that period. To the extent one cares about efficiency, however, the Justice Department's experience offers no reason to believe that the government's suits enhanced welfare. The IBM experience does not undermine the integration approach because many of the practices the Justice Department attacked might well have come out differently under the 2001 version of the approach. Neither does the experience provide any reason for optimism, however. If only because the costs of these efforts were high, and the benefits low (and perhaps nonexistent), the IBM experience provides solid anecdotal support for the market correction approach.

B.   AT&T/Unix

In 1949, the Justice Department sued AT&T and Western Electric Co. The complaint alleged "the defendants had monopolized and conspired to restrain trade in the manufacture, distribution, sale, and installation of telephones, telephone apparatus, equipment, materials, and supplies, in violation of [the antitrust statute]."[55] The complaint sought to divest AT&T of its ownership of Western Electric, and to divest Western Electric of its fifty percent interest in Bell Laboratories, a research center it co-owned with AT&T.[56] After much lobbying, the Justice Department and AT&T resolved the case by entering into a consent decree in 1956. The decree did not require divestiture or other structural relief, but it "precluded AT&T from engaging in any business other than the provision of common carrier communications services."[57]

Between 1969 and 1975, engineers at Bell Labs, most prominently Dennis Ritchie and Ken Thompson, developed a computer operating system that became known as Unix.[58] Developers were interested in Unix but,

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34, 105-06 (D.C. Cir. 2001). That is a fair point, though one could argue that Microsoft's acquisition of rights to products such as QDOS presents a more complex picture than the court of appeals recognized.

   55. United States v. AT&T, 552 F. Supp. 131, 135 (D.D.C. 1982).

   56. *Id.* at 136.

   57. *Id.* at 138.

   58. For a brief history, see Dennis M. Ritchie, *The Evolution of the Unix Time-Sharing System* (1984), *available at* http://cm.bell-labs.com/cm/cs/who/dmr/hist.html. Unix followed from frustration with a project involving GE, Bell Labs, and MIT to de-

under the 1956 consent decree, AT&T could not enter lines of business other than providing common carrier communications services. AT&T's counsel concluded that this restriction did not allow AT&T to exploit Unix. The decree also had required AT&T and Bell Labs to license patents on a nondiscriminatory basis.[59] AT&T counsel concluded that this provision implied an obligation to license Unix.[60] AT&T therefore decided that it could not distribute Unix for commercial purposes but would license it for academic and research purposes.[61]

AT&T licensed Unix to various universities under academic licenses. The most important licensee was the University of California at Berkeley. Thompson spent 1975 teaching at Berkeley and, over the next few years, students and faculty at Berkeley developed tools (complements) for Unix. By 1977, Berkeley was distributing these complements to existing AT&T licensees. Berkeley's distributions were known as "BSD," which stood for Berkeley Software Distribution.[62] This development work produced the BSD license, which is one of the more prominent of the more than forty "open source" licenses.

Beginning around 1979, AT&T realized that Unix had commercial potential. Its lawyers presumably found a way to allay their earlier concerns, and AT&T began to restrict distribution of Unix code and charge significant license fees.[63] By 1979, however, the Unix developers at Berkeley had gone beyond the development of tools. They began modifying the operating system itself.[64] In 1980, Berkeley received a contract from the Defense Advanced Research Projects Agency (DARPA) to adapt Unix for the Agency's ARPANET project, which was a precursor to the Internet. The contract accelerated Berkeley's work on adapting Unix for networking purposes (most importantly by incorporating TCP/IP into Unix).[65] It also set BSD on a path that would eventually diverge from AT&T.

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velop a system called Multics, which stood for "Multiplexed Information and Computing Service." "Unix" is a pun on "Multics." The standard reference work is SALUS, *supra* note 42. *See also* Marshall K. McKusik, *Twenty Years of Berkeley Unix: From AT&T-Owned to Freely Distributable*, *in* OPEN SOURCES: VOICES FROM THE REVOLUTION (Chris DiBona et al. eds., 1999).

59. *AT&T*, 552 F. Supp. at 136.

60. SALUS, *supra* note 42, at 58-59; STEVEN WEBER, THE SUCCESS OF OPEN SOURCE 28 (2004).

61. SALUS, *supra* note 42, at 59.

62. *Id.* chs.16, 18; McKusik, *supra* note 58.

63. WEBER, *supra* note 60, at 38. The license fee was $60,000 per machine for commercial installation and $7,500 per university for an academic license.

64. SALUS, *supra* note 42, at 222-23.

65. *Id.* at 163-72; WEBER, *supra* note 60, at 33-34.

In 1982, the same year it abandoned its 1969 monopolization case against IBM, the Justice Department settled its 1974 antitrust case against AT&T.[66] This settlement took the form of a modification of the final judgment from the 1956 action but, unlike the 1956 decree, this settlement fundamentally altered AT&T's structure by divesting AT&T of its Bell Operating Companies. AT&T retained Bell Laboratories, however. Freed from the line of business restriction in the 1956 decree, AT&T tried to exploit Unix harder.[67] Licensing fees went up, reaching $100,000 for commercial installations by 1988.[68] In 1989, AT&T created Unix System Laboratories (USL) to pursue its Unix business.[69]

By that time, however, the cat was out of the bag. BSD version 4.3, released in 1986, incorporated the TCP/IP stack. Demand for this system was high, and it roughly coincided with AT&T's newfound freedom to exploit Unix and its aggressive attempts to do so. Berkeley Unix still contained AT&T code, however, which gave AT&T the effective right to limit BSD distribution to entities that had the ever-costlier AT&T Unix license.[70] Berkeley responded by distributing its networking code, to which it had exclusive rights, apart from the components that still included AT&T code. In 1989, Berkeley issued "Networking Release 1," under a license that allowed users to make any use of the code they wished, including incorporating the code in commercial applications, so long as they credited Berkeley and left intact Berkeley's copyright notices.

Having built and released its own networking components, it was a logical step for Berkeley to work downward and write its own version of Unix, which did not include AT&T code and which therefore could be distributed to anyone, regardless of whether they held an AT&T license. In 1991, Berkeley issued "Networking Release 2," which was an almost-finished Unix-like operating system.[71] This release produced a complete system called 386/BSD, and eventually three variants: NetBSD, FreeBSD, and OpenBSD. It also became the basis for a commercial Berkeley Unix

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66. Also in 1982, one of the Berkeley graduate students working on Unix, Bill Joy, moved to Sun Microsystems, which licensed Unix from AT&T and then modified that code based on BSD improvements starting with BSD version 4.1C. SALUS, *supra* note 42, at 199. Sun went on to play a key role in the Microsoft antitrust litigation as the proponent of the Java technologies, which the Justice Department cited as a potential substitute for Microsoft's Windows operating system. *See infra* Part III.A.

67. WEBER, *supra* note 60, at 38-39

68. *Id.* at 39.

69. *Id.* at 39-40.

70. SALUS, *supra* note 42, at 210, 222-23.

71. *Id.* at 222-23.

business called BSDI, which began selling its BSD-based system in 1992.[72]

In 1992, AT&T's USL sued BSDI, and then the University of California, for infringing AT&T's rights in Unix. In 1993, AT&T sold USL to Novell, which quickly settled the suit for an agreement by Berkeley not to distribute certain disputed files, and permission by AT&T to allow other disputed files to remain in the BSD distribution. In 1995, Novell sold its Unix business (and, depending on whom one believes, its rights in Unix) to the Santa Cruz Operation (SCO).[73] In 2003, SCO would later assert those rights against, of all firms, IBM, in an indirect assault on the GNU/Linux OS.[74] In 2004, Novell would re-enter the Unix business by acquiring SuSe, the leading German distributor of GNU/Linux.

The variety of Unix systems significantly reduced the value of Unix. This point is important in assessing the *Microsoft* litigation, so it is worth quoting Professor Weber's description of the problem Unix encountered in the decade after 1983:

> The proliferation of partly compatible or incompatible hardware and software was daunting. Apollo, DEC, Integrated Solutions, NSC, and other companies built further versions of BSD. AT&T, Altos, Apollo, Compaq, HP, IBM, Intel, Microsoft, Silicon Graphics, and others had AT&T System 5 derivatives. Cray, DEC, Data General, Motorola, and Unisys offered proprietary Unix systems, most of which were based on 4.2 BSD. The Unix "market" was a mess.
>
> These differences led predictably to pressures for standardization of some kind. Unix user groups were some of the earliest de facto standard bodies for operating systems. But they were fighting an uphill battle. The user groups had no official authority and inadequate market power in a traditional sense. . . . The deeper disagreements came over deciding when, in fact a particular area should be standardized—that is, when innovation was locked in

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72. WEBER, *supra* note 60, at 51, 95-97.

73. SCO had originally been formed to port Unix to Intel's x86 chip, around the same time Microsoft introduced its own x86 Unix port, called Xenix. Microsoft licensed Xenix to software developers, not hardware Original Equipment Manufacturers (OEMs), and to SCO, which produced its first x86 Unix product in 1983. Microsoft later sold Xenix to SCO while retaining an interest.

74. *See* DAVID MCGOWAN, SCO WHAT? RHETORIC, LAW, AND THE FUTURE OF F/OSS PRODUCTION (Minn. Legal Studies Research Paper No. 04-9, 2004), *available at* http://ssrn.com/abstract=555851.

>to a desirable pathway and the overall Unix market should try to
>standardize on it.[75]

As we will see in Part III, the fragmentation issue and the tension between
accepting a certain state of technology as a standard, and pushing for im-
provement before agreeing to standardize,[76] were central to the *Microsoft*
litigation. In that case, the Justice Department complained that Microsoft
had thwarted Sun's Java standardization efforts. It is therefore interesting
to note that, with regard to Unix, Sun itself created significant fragmenta-
tion worries.

In late 1987, AT&T bought twenty percent of Sun and announced that
Sun would receive preferential treatment as AT&T and USL developed
Unix.[77] Unix licensees other than Sun worried that this alliance would
mean the end of collaborative Unix development and would give Sun a leg
up in the marketplace. A group of firms with a stake in Unix development
banded together to defend the idea that Unix should develop as an "open"
standard. This group eventually formed the Open Software Foundation
(not to be confused with the Free Software Foundation, which we will en-
counter in a moment) to promote an open Unix standard. AT&T and Sun
responded by forming Unix International. Each organization eventually
had about 200 members, but each foundered in the recession of 1991 and
1992, about the time Linus Torvalds began work on Linux.[78]

Opinions might vary on whether the Justice Department's 1956 con-
sent decree was good or bad for Unix development. One could tell a story
in which Unix thrived because AT&T could not exploit it, and therefore
essentially gave it to the developer community for five crucial years. On
this account, the line of business restriction allowed a new product to
flourish, which in turn helped build the market for general purpose com-
puters. The moral of this story would be that antitrust may play a useful
role in preventing dominant firms from leveraging their way into new
markets. Alternatively, one could tell a story in which Unix fragmented
because AT&T could not orchestrate its development until it was too late.
On this account, AT&T might well have produced a coherent operating
system in an even shorter period of time if the profit motive had been al-
lowed free reign. The moral of this story is that antitrust intervention can

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75. WEBER, *supra* note 60, at 44. For an even more extensive list of Unix vendors,
see SALUS, *supra* note 42, at 210.
76. *See generally*, Katz & Shapiro, *supra* note 32.
77. SALUS, *supra* note 42, at 216.
78. *Id.* at 217-18; WEBER, *supra* note 60, at 44-45.

disrupt the coordination essential to complex markets characterized by virtual network effects.

Which story is right? Neither, if by "right" one means indisputably correct. Either, if one means logically coherent and factually plausible. What is clear about the AT&T/Unix experience is that the Justice Department did not intend to have the effect it had. Whichever narrative one prefers, the Justice Department did not have Unix in mind when it negotiated the 1956 consent decree, nor when it filed suit again in 1974, as Unix was making its way out of Bell Labs and into the university community. The Justice Department did not have Unix in mind when it settled with AT&T in 1982, which let AT&T know that it could begin exploiting Unix in 1984, when the line of business restrictions ended. Whether what it did was good or bad, the Justice Department did not mean to do it. This fact supports neither the market correction approach nor the integration approach. It serves only as a reminder that unintended consequences count, which is an important point that does nothing to resolve concrete disputes.

C.   GNU/Linux

In 1984, the year AT&T was freed from its line of business restrictions, a programmer named Richard Stallman left MIT's Artificial Intelligence Lab and founded the Free Software Foundation. Stallman objected to commercial software practices, under which rights holders restricted the ability of licensees to modify the source code of a program (or even obtain it) and to distribute the modified versions to others. He decided to combat those practices, and he left MIT to avoid the risk that the university would own any code he wrote. Stallman's initial project, which he called the "GNU" project, was to write a version of Unix that would be free from AT&T's claims.[79]

Stallman planned to release this operating system under a "General Public License" (GPL). The GPL, now in its second version, guarantees that licensees receive the source code to a program and gives licensees the right to modify and redistribute the program, so long as they distribute it under the same terms on which they received it.[80] In other words, a GPL

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79. The history is recounted in David McGowan, *Legal Implications of Open-Source Software*, 2001 UNIV. ILL. L. REV. 241, 261-62. *See also* WEBER, *supra* note 60, at 46-47. As Unix was a play on Multics, GNU was a recursive abbreviation for "GNU's Not Unix."

80. Open Source Initiative, The GNU General Public License (GPL) (1991), *at* http://www.opensource.org/licenses/gpl-license.php.

licensee may modify and distribute code so long as his modified distribution gave others the rights to modify and distribute his code, too.[81]

The GPL uses copyright law to subvert copyright's normal operation. Copyright grants rights to authors or original works fixed in a tangible medium. Commercial authors use the default right to exclude in order to extract from users payment and agreement to limitations on use the author wishes to impose. Among these rights are the rights to make works based on the original work (derivative works),[82] so the default rights structure extends to modifications, too.

As a sociological matter, a developer who releases code under the GPL invites other developers either simply to run the code or to collaborate with him in improving the code. The GPL gives the initial developer, and each subsequent improver, confidence that no one will appropriate his work for their own profit. At a minimum, people who use but do not improve the code expand the installed base of the code and therefore, to the extent the code is subject to network effects, confer positive externalities on other users, including the developers. Persons who improve the code provide their improvements and enhance the sense of community and collaboration that may be associated with a project (though it need not be).

It bears repeating that F/OSS development rests squarely on copyright law. Without copyright, there is no copyleft.[83] F/OSS development is a far cry from the property-less Nirvana it is sometimes described as being. Thus far, however, it has proved to be an effective way of producing code that competes with more conventional software in some significant commercial markets.

Free or open-source development practices entered the *Microsoft* litigation in the form of the GNU/Linux operating system. We will examine its relevance to the litigation in the Part III, but its history is better covered here. As noted above, Unix forked repeatedly as developers cloned different versions of it. One of the clones, developed by Professor Andrew Tenenbaum in 1987, was called Minix.[84] In 1991, Linus Torvalds began work in Minix on a Unix-like operating system (or, depending on whom

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81. For a more detailed explanation, see MCGOWAN, *supra* note 74.

82. 17 U.S.C. § 106(2) (2000).

83. A phrase I borrow from Professor Eben Moglen, who is general counsel to the Free Software Foundation.

84. WEBER, *supra* note 60, at 100.

you believe, an operating system with Unix code in it), which eventually became known as Linux.[85]

Emerging just as the Open Software Foundation and Unix International collapsed, Linux was a breath of fresh air for Unix-style development. Torvalds licensed his code under the GPL, shared it freely, and revised it frequently, thereby giving developers rapid gratification either in terms of the evolution of the operating system, development of a developer community, reputational capital as expert programmers, or one or more of the above.[86]

This model has been tremendously successful. In 1993, a firm called Red Hat was founded to make it easier for consumers to install and configure Linux.[87] In 2000, IBM announced support for Linux, as part of a bet that Linux would alter the paradigm of computing in which Microsoft had displaced IBM as the dominant platform firm, with IBM making money as a services and consulting firm working on a commoditized, open-source operating system.[88]

At the time of the Microsoft trial, the GNU/Linux OS was credible enough to appear as a potential entrant to the operating systems market. Both sides tried to use the prospect of entry to their advantage. In Microsoft's view, that prospect constrained its market power, and thus furthered its claim that it was not a monopolist. In the Justice Department's view, GNU/Linux would be a desirable platform to which an applications firm might port Microsoft office if Microsoft were broken up into two firms.

Because the GNU/Linux operating system played a significant role in the *Microsoft* litigation, it is important to remember two things about the model that produces that system. First, notwithstanding a great deal of discussion about "distributed" production, the GNU/Linux system is maintained through a fairly narrow hierarchy.[89] If there is a dispute regarding

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85. Strictly speaking, Linux comprises only the kernel, or core, of the operating system, which relies heavily on GNU programs as well. This is why I refer to it as the GNU/Linux operating system.

86. The literature discussing the motivation of open-source programmers is quite large. An important paper modeling motivation as rational within a reputational payoff game is Josh Lerner & Jean Tirole, *The Simple Economics of Open-Source* (Feb. 2000), *at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=224008. For a survey of the literature, see WEBER, *supra* note 60, ch.5.

87. WEBER, *supra* note 60, at 108.

88. *Id.* at 203.

89. McGowan, *supra* note 79, at 268-69.

whose code goes into the Linux kernel, ultimately one person can resolve it.[90]

Second, because anyone may reproduce and make derivative works of GPL'd code, such as the Linux kernel, there is no legal impediment to the proliferation of different versions of Linux (known as "forking" the code base), presenting a risk of the fragmentation that plagued Unix. On at least a couple of occasions, Torvalds faced a serious threat of a fork in Linux development.[91] At present, GNU/Linux development is increasingly being driven by firms that produce goods or services complementary to the operating system.[92] These firms would like a commoditized complement to their business model, and this rational competitive desire may constrain forking, but whether it will do so as the GNU/Linux OS gains market share remains to be seen.

III.   THE *MICROSOFT* CASES

So much has been written about *United States v. Microsoft Corp.* that the case seems drearily familiar already. In this Part, I will try to demonstrate that there is still something useful to learn from the experience. I relate the D.C. Circuit's standard of liability for monopolization, and in particular its discussion of causation, to the error cost debate. I emphasize the record developed on remand, which served as the basis for the district court's decision to impose only modest remedies that were largely agreed upon between Microsoft and the Justice Department and to reject the more drastic remedies proposed by certain states. That record has not received as much attention as some of the evidence adduced during the liability phase of the trial. With regard to the error cost debate, however, the record in the remedy phase is as significant as the record developed in the liability phase of the proceeding.

I focus on four aspects of the case: Sun's Java technologies; Microsoft's "commingling" of browser code with operating system code; license restrictions on Original Equipment Manufacturer (OEM) modifications to the Windows user interface; and the role of open source licensing in both

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90. For an example involving the incorporation of the TCP/IP stack into the kernel, see WEBER, *supra* note 60, at 104-05.

91. *Id.* at 117.

92. The reader is invited to contemplate the logos of firms supporting Open Source Development Labs, which begins to look like a NASCAR endeavor when its sponsorship is on parade. On open-source development as part of the business strategy of various firms, see Michelle Levesque & Greg Wilson, *Women in Software: Open Source, Cold Shoulder*, SOFTWARE DEV., Nov. 2004, *available at* http://www.sdmagazine.com/docu ments/s=9411/sdm0411b.html (subscription site).

the proposed breakup of Microsoft and, later, in the proposed open-source release of its browser code. In each aspect, the D.C. Circuit's analytical approach led it to hold lawful conduct that actually harmed competitors, and could conceivably have harmed competition (though I do not believe such harm was proven), while condemning conduct that caused little or no harm to competitors, much less to competition in general.

A.   Sun Microsystems' Java Technologies

United States v. Microsoft Corp. began as a contempt proceeding based on Microsoft's integration of its web browser into its operating system. The theory of the government's case was that Netscape's Navigator browser might develop into a platform of its own, so Navigator was at least a potential substitute for Microsoft's Internet Explorer.[93] On this theory, Navigator represented a potential path of innovation in which the dominant firm moved up the computing hierarchy from the operating system to an application that interfaced with the Internet and other applications.

The browser theory had its problems. The browser was not a comprehensive platform. There was no realistic prospect that it would become a meaningful operating system substitute in the foreseeable future. When Netscape's CEO testified at trial that Netscape itself did not envision that the browser would become a substitute for Internet Explorer,[94] it was hard to see how Netscape would have eroded Microsoft's market power significantly, even if one accepted that Microsoft harmed Netscape by leveraging that power. Although whether that fact should matter to antitrust policy is a separate question, it is fair to say that the browser theory lost its appeal in rough proportion to the degree of information available about Netscape. In addition, it was not clear how far this theory advanced the idea of competition rather than the welfare of Netscape as a competitor. The theory did not imply that there would be perfect competition, or anything close to it, but that there would be a new platform consisting of technology in which a different firm—but still only one firm—held the rights.

As the case progressed, and the browser became a less plausible substitute for Internet Explorer, the government shifted its emphasis to Sun's

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93. *Microsoft I*, 147 F.3d 935 (D.C. Cir. 1998) (affirming district court finding that Microsoft was not in contempt of the settlement decree; reversing district court order preventing Microsoft from demanding that OEMs license its web browser if they wanted to license its operating system).

94. *See* McGowan, *supra* note 27, at 787 n.199 (citing Testimony of Jim Barksdale, United States v. Microsoft Corp., 97 F. Supp. 2d 59 (D.D.C. 2000) (Nos. 98-1232, 98-1233), *available at* http://www.usdoj.gov/atr/cases/f1900/1999.htm).

Java technologies.[95] I will describe the technologies in more detail in a moment. For now, it is enough to say that Java technologies were designed to (eventually) allow application developers to write a program that would run on any operating system that also employed the technologies. If this vision became reality, Java would introduce competition into the operating systems market by lowering the applications barrier to entry into that market. An operating system vendor would only need to write a Java Virtual Machine (JVM) for its operating system, and any application written with the Java technologies would run on that system. Any number of operating systems could employ this strategy, so Java could lead to robust competition in the operating systems market.

Like the browser theory, the Java theory did not promise to eliminate all market power. On this theory, Java would replace Windows as the dominant computing technology, and Sun (rather than Netscape) would replace Microsoft as vendor of the *de facto* platform standard. There would be robust competition above and below the Java layer, but that layer would be owned by Sun. Sun would have supplanted Microsoft, but then Sun would be the monopolist. It is worth pausing to ask whether, as a matter of antitrust policy, such a goal is worth pursuing. Monopoly power at one level of a vertical stack of tight complements will affect the stack as a whole, and competition at each level. There was no reason to believe that competition in personal computer markets would approximate the model of perfect competition just because Netscape or Sun supplanted Microsoft as the platform monopolist. Why should the government spend millions of dollars, and risk setting precedent that might deter welfare-enhancing acts, just to move the monopoly position up one level in the computing hierarchy?

There are two possible answers to this question. First, barriers to entry might be lower farther up the stack, producing a reduction in market power and a corresponding consumer benefit. If true, that is at least a cogent theory. Second, it might not matter whether there is a platform monopolist in the computing hierarchy, much less who it is or at what level it supplies products. Even if competition in this market followed a Schumpeterian model, the antitrust law might still ensure that the fight is fair. On

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95. The browser subsequently became significant more in terms of its role a distribution channel for Java than for any potential that it would become a platform substitute for Windows. *See* David McGowan, *Has Java Changed Anything? The Sound and Fury of Innovation Litigation*, 87 MINN. L. REV. 2039, 2041 (2003). The discussion in this portion of this Article draws heavily upon my earlier analysis, though it also revises that analysis to account for weaknesses in the appellate court's opinion that I should have given more weight the first time around.

this view, by acting as a referee to ensure a fair fight antitrust might increase confidence that the best fighter won. Appealing as it is, however, the referee metaphor promises more than reality delivers. Two aspects of the Java portion of the proceeding deserve close attention: Microsoft's modification of the Java technologies and Microsoft's alleged confusion of software developers.

1. Microsoft and Java Fragmentation

The most interesting aspect of the Java allegations was the Justice Department's claim that Microsoft maintained its monopoly by attempting (with some success) to fragment Java as a technology standard. The evidence calls to mind the fragmentation of Unix, which undermined its potential to become a coherent operating system standard. As noted above, Sun's alliance with AT&T encouraged the fragmentation of Unix. In the *Microsoft* case, the shoe was on the other foot.

a) District Court Findings

Much of the evidence regarding the fragmentation theory had to do with Microsoft's development of Java technologies. The relevant technologies include the Java programming language and the Java class libraries, which contain application programming interfaces (APIs). Developers could use these technologies to write Java programs, and these programs would run on a Java compiler, which would translate them into Java "bytecode." The bytecode in turn would run on a JVM, which are software programs written for specific operating systems. JVMs translate Java bytecode into instructions the particular operating system can execute.[96]

The gist of the government's charge was that Microsoft maintained its monopoly power by developing technologies that allowed Java to function well as a set of development tools for Windows but impeded the degree to which Java could serve as new platform. I will briefly summarize the principal allegations.

At the time relevant to the litigation, the Java class libraries did not provide enough interfaces to allow developers to write sophisticated programs without invoking some code from an underlying operating system.[97] The manner in which developers invoked this code was important to the path of Java's development. The district court found that Sun recognized this problem and "sponsored a process for the creation of a software method that would allow developers writing in Java to rely directly upon" code specific to particular operating systems "in a way that would never-

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96. *Id.*
97. *Microsoft II*, 84 F. Supp. 2d 9, 105 (D.D.C. 1999).

theless allow them to port their applications with relative ease to . . . different operating systems."[98]

Notwithstanding the Sun-sponsored process, Microsoft produced its own set of Java development tools and complementary products such as a Microsoft JVM.[99] The net result of these efforts was a distinctive "Java runtime environment" for Windows that was incompatible with the environment Sun sponsored. In part, Microsoft developed its own methods for software developers to invoke "native" operating system code (meaning code specific to a particular operating system running underneath the JVM).

Microsoft's methods were incompatible with Sun's, and they created a trade-off. The district court found that programs written with Microsoft's methods ran slightly faster on Windows than did programs written with Sun's methods. On the other hand, a program written with Microsoft's methods was harder to port to other operating systems than programs written with Sun's.[100] The district court found it would have been inexpensive for Microsoft to implement Sun's methods along with its own, but that Microsoft refused to do so until ordered to do so by a court.[101]

In addition, Microsoft created two "keywords" and "compiler directives" that added to the functions Java could perform but which also worked only with Microsoft's JVM. Microsoft shipped its Java developer tools with these keywords and compiler directives enabled by default; if a developer did not wish to use them, she would have to turn them off, using a menu option available for that purpose.[102] If a developer used these tools, the developer's program would run only on Windows and would be incompatible with other JVMs.

Microsoft also developed a high-performance JVM for Windows, which ran programs faster than other JVMs. Because Java technologies comprised a translation system, in which Java bytecode was translated into code an underlying operating system could execute, Java programs necessarily ran somewhat slower than programs written directly for an operating system. The faster a JVM ran, the less of a difference there would be between a Java program written for the JVM and one written for the underly-

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    98. *Id.*
    99. It did so under a license from Sun, which Sun later alleged Microsoft had breached.
    100. *Id.*
    101. *Id.* at 106.
    102. *Id.* at 106-07.

ing operating system, so this faster JVM tempted developers to write Java for Windows rather than cross-platform Java.[103]

Microsoft's strategy of developing Windows-specific Java technologies also formed the basis of the charge that Microsoft impeded Java's progress by fooling developers into writing Windows-specific programs when they in fact wished to write cross-platform programs. The district court found that Microsoft failed to warn developers that its Windows-specific Java extensions were enabled by default, and that the default mode of Microsoft's Java development tools would therefore produce Windows-specific programs rather than cross-platform programs.[104] The court concluded that Microsoft intended to deceive developers,[105] but it did not find that any developers actually had been deceived.[106]

b)   The Court of Appeals' Fragmentation Analysis

The D.C. Circuit treated Microsoft's development of its JVM and Java developer tools as product development decisions. With respect to such decisions generally, the court said that courts should view skeptically "claims that competition has been harmed by a dominant firm's product design changes."[107] The court reasoned that firms in competitive markets innovate to attract or increase demand, and innovation sometimes produces incompatible products. It worried that imposing liability for the design of incompatible products would deter innovation. On the other hand, it also said that "judicial deference to product innovation . . . does not mean that a monopolist's product design decisions are per se lawful."[108] As a formal matter, the court opted for balancing, holding that the proper test is that, "in order to violate the antitrust laws, the incompatible product must have an anticompetitive effect that outweighs any procompetitive justification for the design."[109]

At first glance, the court's balancing rhetoric seems to fit nicely with the integration approach. A closer look invites doubts, however. To say that innovation generates demand is to say only that either false positive or false negative findings would be costly. The integration approach seems to require straightforward cost-benefit analysis of all relevant effects, includ-

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103. *Id.* at 108.

104. *Id.* at 106-07.

105. *Microsoft III*, 87 F. Supp. 2d 30, 43 (D.D.C. 2000), *aff'd in part and rev'd in part*, 253 F.3d 34 (D.C. Cir.) (en banc), *cert. denied*, 534 U.S. 952 (2001).

106. McGowan, *supra* note 95, at 2045.

107. *Microsoft IV*, 253 F.3d 34, 64 (D.C. Cir. 2001) (en banc).

108. *Id.* at 65.

109. *Id.* at 75.

ing the effects of product design decisions, and the court's balancing rhetoric is consistent with this view. However, the court's skepticism presumably is rooted in the sort of experience on which the market correction approach stakes its claims. In fact, the court's analysis was so deferential that what it did came closer to a rule of per se legality for design decisions than to true cost-benefit balancing.

The court of appeals first held that Microsoft could not be found liable for developing its own JVM, even though that JVM was incompatible with Sun's Java implementation. The court reasoned that Microsoft's JVM ran programs written for Windows faster than did other JVMs and "[did not] itself have any anticompetitive effect."[110] This ruling shows how willing the court was to break down Microsoft's conduct into individual parts and then analyze each part separately. The court acknowledged that Microsoft's development of its JVM was related to its development of Java development tools, and to its alleged deceit regarding those tools, but the court considered the JVM development effort on its own and acquitted Microsoft of liability for that effort.

The court's fine-grained analysis is what one would expect from the integration approach, but its willingness to accept that faster is better without weighing the degree to which Microsoft's JVM may have fragmented a nascent standard is not consistent with that approach. It is market-correction-style analysis, plain and simple. The court's analysis combined very detailed review of individual aspects of conduct with relatively categorical standards of review, producing an odd result that endorsed balancing in the abstract but avoided it in the particular.

The court's treatment of the development tools issue strengthens the sense of tension in the court's analysis. The court held that Microsoft could not be found liable for producing Java development tools that were incompatible with Sun's Java implementation. Its explanation for this acquittal was breathtakingly brief. Here it is, in full: "The District Court found that, not only were these tools incompatible with Sun's cross-platform aspirations for Java—no violation, to be sure—but Microsoft deceived Java developers . . . ."[111]

It is hard to know what to make of this language. It no doubt follows from the court's general skepticism of allegations regarding design incompatibilities. The court said that skepticism of such allegations did not imply a per se rule that design decisions are lawful, however, while the "to be sure" aside at least leaves room for such a rule. The court made no ef-

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110. *Id.* at 70.
111. *Id.* at 76.

fort to weigh the effects of Microsoft's development of such tools. The court also treated the development of tools in isolation, as it did with development of the JVM, even though it recognized that the two developments were closely related.[112]

The court's use of broadly skeptical assumptions in its examination of particular conduct obscured the strength of the Justice Department's charges and the district court's conclusions. It was perfectly logical for the Justice Department to allege that Microsoft acted in an anticompetitive manner by trying to fork Java. The history of Unix shows that fragmentation may stall the adoption and development of a platform. It is hard to believe that the lessons of that history were lost on either Microsoft or Sun, and therefore it is perfectly plausible to conclude that the Justice Department and the district court's more contextual approach captured an aspect of Microsoft's conduct—call it synergistic anticompetitiveness—that the appellate court's approach missed.

Because both logic and experience suggest that forking a nascent standard may undermine adoption and development of the standard, it is plausible to assert that the anticompetitive effects of Microsoft's Java development efforts exceeded the benefits of that work. I happen to agree with the appellate court's conclusions on these issues, and in fact would have gone farther than it did in exculpating Microsoft, but one has to admit that the court's analytical approach did not adequately refute the arguments it rejected.[113]

The court's acquittal of Microsoft's work on Java developer tools was qualified somewhat by its affirmation of the district court's conclusion that Microsoft engaged in monopolization by deceiving software developers. Unfortunately, that affirmation was probably the low point of the opinion. To understand why, one must bear in mind that, earlier in its opinion, the court had cautioned against using a party's intention as a basis of liability.[114] The court there warned that intention was relevant to monopolization only insofar as it "helps us understand the likely effect of the monopolist's conduct."[115]

The court's treatment of the developer deceit claims was inconsistent with these principles. The court of appeals treated the district court as having found that Microsoft actually had deceived developers, but the district

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112. *Id.* at 75.

113. For a similar analysis of the court of appeals' treatment of these allegations, see Einer Elhauge, *Defining Better Monopolization Standards*, 56 STAN. L. REV. 253, 318-19 (2003).

114. *Microsoft IV*, 253 F.3d at 59.

115. *Id.*

court had found no such thing. The lower court found only that Microsoft hoped and intended to deceive developers, which under the D.C. Circuit's own standard is quite different. Other than one vague, hearsay reference from a combative Sun witness,[116] there was no record evidence that any developer had ever been deceived into writing Windows-specific programs when she intended to write cross-platform programs. If it existed, evidence of actual developer confusion would have been so easy to obtain that the government's failure to show even a single instance of such confusion supports a strong inference that there was none. Developers write code for a living, after all, and it seems highly unlikely that they would be unable to work through a menu option and disable Microsoft's Windows-specific tools if they wanted to write cross-platform programs.

The court of appeals said Microsoft had offered no justification for its "campaign to deceive developers,"[117] but that characterization is too slanted for a case based on nondisclosure rather than misrepresentation. It also makes no sense. The court itself said the tools helped developers write programs that would run faster (through the Microsoft JVM) than programs written with Sun's technology. If this aspect of Microsoft's conduct was procompetitive, as the court held it was, then why would it be anticompetitive for Microsoft to make these competitive products the default option in its Java development distribution? What purpose would be served by making developers incur even the trivial marginal cost of enabling these supposedly competitive tools? Why would the antitrust laws force Microsoft to make an efficient option costlier to implement by requiring that developers opt into it rather than requiring that developers who do not wish to use the technologies opt out? If the answer is that it would minimize fragmentation, why was development of incompatible tools (which one could plausibly if not inarguably conclude were designed to fragment Java) lawful in the first place? Perhaps there are answers to these questions, but I doubt that they are very good. Most likely they would take the form of assertions about a balance of costs and benefits for which there was little if any data, imprecisely weighed.

The court's application of its liability standard is both more abstract and categorical than the language of the standard suggests. Acts the court sees as part of a set of good activities, such as product design, are lawful, without the need to balance actual costs and benefits. Acts the court sees as part of a set of bad activities, such as deceit, are unlawful regardless whether they actually worked. The result is analysis that is at once oddly

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116. *See* McGowan, *supra* note 95, at 2045-46 (citing *Microsoft IV*, 253 F.3d at 77).
117. *Microsoft IV*, 253 F.3d at 77.

categorical and nuanced to the point of hair-splitting. The court's analysis is detailed enough to distinguish the JVM from developer tools, and the tools from knowledge about them, and categorical enough to treat the first two subjects very differently from the third, while being with respect to all three charges relatively indifferent to the actual balancing of real-world costs and benefits.

Under the liability standards it articulated, the court should have rejected the developer deceit allegations on the ground that the deceit caused no harm. Under those same standards, however, the court should have taken more seriously the charge that Microsoft's Java development work was unlawful because it fragmented a possible substitute standard. At the end of the day, I agree with the court's rejection of those claims, and in fact think the court should have rejected all the claims related to Microsoft's development of a Windows-oriented Java runtime environment. However, the court's hybrid approach made a mess of the allegations, condemning the trivial acts and approving the significant ones, and doing so by using categorical analysis that is at odds with the balancing approach it was supposed to have employed.

c)   The Causation Argument

The Justice Department's allegations concerning Java provided the occasion for the court of appeals' discussion of the question of causation. That discussion relates directly to the question of error costs, and to the larger question whether antitrust should be enforced through the SWAT team model or the traffic cop model. A bit of background is necessary to place the discussion in context.

Adopting a remedy proposed by the Justice Department, the district court ordered that Microsoft be broken up into two companies. One would produce operating systems, such as Windows. The other would produce applications, such as Microsoft Office.[118] The court of appeals reversed this order, noting in part that the order rested on a number of liability findings it had rejected.

The court of appeals also chose the remedy question as the appropriate way to deal with one of Microsoft's main arguments regarding liability for its Java-related conduct. Microsoft insisted that it should not be held liable for monopolization with regard to that conduct because the government failed to prove that, but for its allegedly anticompetitive conduct, Microsoft would have lost any market power. In other words, the government

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118. United States v. Microsoft, 97 F. Supp. 2d 59, 64 (D.D.C. 2000) (final judgment).

had not shown that Microsoft's Java-related conduct caused it to maintain its market power beyond the point at which such power would have eroded had it not engaged in that conduct.[119]

The court of appeals rejected this argument as it applied to liability. It found no precedent for the proposition that, in an equitable enforcement action, the government had to "present direct proof that a defendant's continued monopoly power is precisely attributable to its anticompetitive conduct."[120] The court said that to require plaintiffs to present such proof would only "encourage monopolists to take more and earlier anticompetitive action."[121] The court was therefore willing to infer causation "when exclusionary conduct is aimed at producers of nascent competitive technologies" in part on the ground that this inference made the defendant "suffer the uncertain consequences of its own undesirable conduct."[122]

Two aspects of the court's reasoning are significant. First, if one believes the monopolization offense is concerned with anticompetitive effects, rather than the regulation of conduct as such, this reasoning is circular. It infers anticompetitive effects from the badness of an act, rather than condemning an act as bad because of its effects. Second, this inference forms the front end of an error-cost argument that, though it does not proclaim itself as such, is a perfect example of the integration approach. Though the court was not concerned with causation at the liability phase, it was concerned about causation when it came to choosing a remedy. The court said that, "absent some measure of confidence that there has been an actual loss to competition that needs to be restored, wisdom counsels

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119. *Microsoft IV*, 253 F.3d at 78-80.

120. *Id.* at 79. It is not clear why the court thought an equitable enforcement action should be treated differently from a private action. Earlier in the opinion, the court said that "[i]n a case brought by a private plaintiff, the plaintiff must show that its injury is of 'the type that the statute was intended to forestall'" and that "no less in a case brought by the Government, it must demonstrate that the monopolist's conduct harmed competition, not just a competitor." *Id.* at 59. Section 28 of 15 U.S.C., which the court did not cite, might support the idea that the United States could enjoin conduct that harmed no one simply because it was unlawful, but that interpretation of the statute both assumes that the antitrust laws condemn conduct that does not harm competition and ignores the court's statement that the government must prove harm to competition.

121. *Id.* at 79.

122. *Id.* ("[T]he question in this case is not whether Java or Navigator would actually have developed into viable platform substitutes, but (1) whether as a general matter the exclusion of nascent threats is the type of conduct that is reasonably capable of contributing significantly to a defendant's continued monopoly power and (2) whether Java and Navigator reasonably constituted nascent threats at the time Microsoft engaged in the anticompetitive conduct at issue.").

against adopting radical structural relief" in part because the long-term effects of divestiture are uncertain.[123]

From the perspective of the integration approach to error costs, this two-tiered approach to causation is perfectly logical. If there is some reason to believe an act is not good, but little reason to believe it has caused harm, then the act should be enjoined rather than made the basis for significant structural reform. A sliding scale connecting confidence in causation with the severity of remedy connects the probability of error to the magnitude of error, thus lowering the expected cost of error. It is just what the doctor ordered. Just as the court's two-tiered approach to causation may be read as a device to limit error costs, one's view of the relationship between causation and error costs expresses a position on the larger question whether the monopolization offense should be viewed as SWAT team antitrust or traffic cop antitrust. The integration approach to error costs, and the sliding scale relating confidence in liability to severity of remedy that implements it, leans strongly toward a traffic-cop view of antitrust.

In fact, unlike the market correction approach, which insists on fairly strict limits but has only anecdotal, backward-looking justifications for them, the integration approach admits of no limits on antitrust review at all. The integration approach is an extension of a logical, decision-theoretic process, and there are no logical limits to that process. Practical limitations might arise, such as the cost of acquiring the marginal unit of information needed to take analysis one step further, but the approach itself has no boundary. On this view, it makes perfect sense to speak of antitrust violations that do not harm competition (the acts in question may produce net losses) or of monopolies maintained through acts that do not prolong monopoly.

In contrast, advocates of a market correction approach to error costs, of which I am one, would reject the D.C. Circuit's command that "in devising an appropriate remedy, [on remand] the District Court also should consider whether plaintiffs have established a sufficient causal connection between Microsoft's anticompetitive conduct and its dominant position in the OS market."[124] We would not say, as the court of appeals did, that "if the court on remand is unconvinced of the causal connection between Microsoft's exclusionary conduct and the company's position in the OS market, it may well conclude that divestiture is not an appropriate remedy."[125] Rather, the court should dismiss the case altogether, because if there is no

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123. *Id.* at 80.
124. *Id.* at 106.
125. *Id.* at 107.

connection between Microsoft's conduct and its market position, then there was no violation in the first place.[126]

The court of appeals' reluctance to employ strict causation standards at the liability phase of the proceedings sheds some light on its odd use of seemingly categorical propositions to engage in a particularized review of discrete acts. The court's analysis is too detailed for the market correction approach, which would advise against judges intruding so far into business decisions and inferring liability from ambiguous or poorly explained acts. The analysis is also too general for a true integrationist approach, which would substitute true cost-benefit balancing for the court's skeptical, categorical balancing.

It was clear after the court of appeals' decision that Microsoft would not be broken up. The court of appeals did not preclude such a remedy, but its position was apparent. What remained for the district court on remand was to choose a remedy "tailored to fit the wrong creating the occasion for the remedy."[127] Like the integration approach, this command had the compelling rational appeal of the idea of equilibrium. It was aesthetically pleasing and logically unimpeachable. It had no truck with off-the-rack presumptions. It was a complete pipe dream.

d)   The Remand Proceedings and the (Lack of a) Remedy

Insofar as the JVM and Java development tools arguments were concerned, the court of appeals handed the district court a complete mess. Microsoft's development of the JVM and its Java developer tools had been lawful, and therefore had to be disregarded in tailoring a remedy. Microsoft's alleged deception of developers was unlawful, and therefore could be the basis for a remedy, even though no developers were deceived.

On remand, the evidence showed that the worst thing Microsoft had done to Java was to fork the technology by producing a Microsoft-specific Java runtime environment. Carl Ledbetter, a witness for the nine states that did not accept the consent decree agreed to by Microsoft and the Justice Department, testified that Microsoft's development of a Java runtime environment that deviated from Sun's authorized implementation was "crippling" to Java's position in the market, and a substantial cause of

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126. *See* Alan J. Meese, *Monopolization, Exclusion, and the Theory of the Firm*, 89 MINN. L. REV. 743, 770 (2004) (referring to D.C. Circuit's imposition of liability without requiring a finding of causation as "entirely circular").

127. *Microsoft IV*, 253 F.3d at 107.

Java's failure to become a viable substitute for Windows.[128] The court of appeals had, of course, held that this conduct was legal, so there was no basis to try to remedy it.

That left the alleged deception of developers. There was no evidence that anyone had been deceived, but what if there had been? Would it have mattered? Professor Carl Shapiro was the principal causation witness for the non-settling states.[129] He testified that he knew of no evidence that any developers actually had been confused, and that he did not regard the alleged deception as "having the most significant effects."[130] (Because there was no evidence of confusion this testimony actually overstates matters.) Not surprisingly, the district court found that developer deception amounted to a "single, very specific incident of anticompetitive conduct," which Microsoft had ceased, and which posed no threat of continuing harm from developer deception.[131] The district court therefore ordered no remedy relating to this conduct, a ruling the D.C. Circuit affirmed.[132] For those keeping score, the final result on the technology-related Java allegations is: what was harmful (at least to competitors, though not, in my view, to competition) was not illegal, and what was illegal was not harmful, so no remedy was required.

No matter how you look at it, litigation of the Java allegations produced a mess. It would have been better for the court to follow the market correction approach to its logical conclusion, and reverse liability with regard to all these charges. Alternatively, the court could have followed the integration approach to its logical conclusion and balanced the costs and benefits of the development work through which Microsoft fragmented Java, without viewing that work categorically and in isolation as almost *per se* lawful. I believe the latter approach would lead to an intolerable amount of judicial involvement in product design, in pursuit of chimerical litigation equilibriums, so that the former approach is by far the better one. Because the court's stated approach essentially tracks the integration approach to error costs, the Java mess stands as anecdotal evidence in support of the market correction approach. Even if one is inclined to criticize

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128. Transcript of Trial Record at 1700-01, *Microsoft V*, 224 F. Supp. 2d 76 (D.D.C. 2002) (No. 98-1233) [hereinafter Trial Transcript] (testimony of Carl Ledbetter on March 27, 2002).

129. *Microsoft V*, 224 F. Supp. 2d at 149.

130. Trial Transcript, *supra* note 128, at 3439 (testimony of Carl Shapiro on April 11, 2002). Professor Shapiro also testified that his view of the effect of Microsoft's fragmentation of Java was consistent with the view expressed in Mr. Ledbetter's testimony.

131. *Microsoft V*, 224 F. Supp. 2d at 265.

132. *Microsoft VII*, 373 F.3d 1199, 1213 (D.C. Cir. 2004).

the court as having been too intrusive rather than too lenient, however, one has to concede that the disposition of the Java allegations in the *Microsoft* litigation stand as an example of how hard it is for even a very able court to follow the integration logic where it leads.

2. *Exclusive Agreements*

Both the district court and the court of appeals found Microsoft liable under section 2 of the Sherman Act for entering into certain agreements with Independent Software Vendors ("ISVs"). Under the relevant agreements, Microsoft would provide technical benefits to ISVs only if they agreed to use Microsoft's JVM as their default JVM.[133] The district court thought developers had to use Microsoft's Java development tools to ensure compatibility with its JVM, implying that developers would write Windows-only programs.[134] If the developers wrote Windows-specific programs, they would have no incentive to distribute any JVM other than Microsoft's, meaning any JVM that complied strictly with Sun's standards rather than adding to them (as with Microsoft's additional keywords). Thus, Microsoft's agreements might raise the cost to Sun of distributing its authorized JVMs, possibly impeding the advance of cross-platform Java.[135]

The court of appeals affirmed the district court's liability findings with respect to these agreements. The court agreed that effective foreclosure of an efficient distribution channel was an anticompetitive act, and it rejected Microsoft's justification for that act, which the court described as being only that the "ISV agreements reflect an attempt 'to persuade ISVs to utilize Internet-related system services in Windows rather than Navigator.'"[136] The court thought this explanation meant nothing more than that keeping developers focused on Windows would preserve Microsoft's monopoly, which it characterized as a "competitively neutral" goal.[137] The court therefore found that Microsoft had not justified its conduct, so once again it did not reach the balancing portion of its liability analysis.

It is not clear what the court of appeals meant by saying that Microsoft's efforts to promote distribution of its Java technologies were com-

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133. *Microsoft II*, 84 F. Supp. 2d 9, 108 (D.D.C. 1999).

134. *Id.* The record showed that Microsoft's JVM ran programs written in pure Java (not employing the Microsoft extensions) very well, so it is not clear why the district court thought this. For the evidence, see McGowan, *supra* note 95, at 2048-49.

135. I say "possibly" because during the periods relevant to the litigation (and to date), Java never actually lived up to the promise that a developer could write a program once and have it run on any platform. *See id.*

136. *Microsoft IV*, 253 F.3d 34, 72 (D.C. Cir. 2001) (en banc).

137. *Id.*

petitively neutral. The court found that Microsoft's *development* of those technologies was a form of competition, so what was wrong with actively promoting their use by developers and their distribution? Why would such acts not be a form of competition, too? The court seems to have avoided balancing the harms of Microsoft's agreements against the benefits of such distribution, which the last stage of its liability test would require. Instead, the court simply restated Microsoft's argument in a less sympathetic way while ignoring its own holdings regarding development of the technologies distributed under the agreements.

The entire set of Java-related allegations depicted a standards battle in which Microsoft and Sun competed to sponsor the dominant version of the Java technologies. It would make sense to say that the battle was anticompetitive because Java belonged to Sun, which had the exclusive right to define the parameters of the standard, so that Microsoft's fragmentation was unlawful.[138] If the court was unwilling to go so far, however, its rejection of Microsoft's argument seems another example of judicial hairsplitting that deems the truly significant conduct lawful while tinkering at the margins of distribution costs that meant little in light of the fragmentation of the underlying technology.

B.   Browser Integration

The district court found Microsoft liable for preventing OEMs from serving as a viable distribution channel for competing browsers. It found that Microsoft did this in part by integrating its web browser into its operating system.[139] By integrating browser code with operating system code, Microsoft allegedly made it harder for OEMS to be sure they would not impair Windows' performance if they installed a competing browser before shipping a computer. In addition, OEMs incur most of the cost of supporting users who need help with their machines. A novice user might be confused if more than one web browser icon appeared on a desktop, leading to higher support costs; OEMs could avoid these costs by hiding those icons or otherwise concealing access to Microsoft programs.[140] However, because OEM margins were tight, the court believed they were

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138. Such a ruling would have raised some questions—why, for example, should Sun have the exclusive right to control Java when Microsoft was found liable for exerting too much control over the desktop—but there were plausible answers for those questions.

139. *Microsoft III*, 87 F. Supp. 2d 30, 39-40 (D.D.C. 2000), *aff'd in part and rev'd in part*, 254 F.3d (D.C. Cir.) (en banc), *cert. denied*, 534 U.S. 952 (2001).

140. *Microsoft II*, 84 F. Supp. 2d 9, 49-50 (D.D.C. 1999).

unlikely to incur such additional costs, making Microsoft's commingling of code prohibitive of OEM installation of competing browsers.[141]

The court of appeals analyzed the general integration claim as three individual acts. First, Windows would sometimes launch Microsoft's browser automatically even if a user had chosen another default browser. The examples of such cases introduced at trial involved users accessing Microsoft's own computers, as they might do in obtaining help or updates for their operating system. The court found that Microsoft had demonstrated valid technical reasons for launching its own browser in such cases, and that Microsoft therefore could not be held liable for this design choice.[142]

The court affirmed liability for the remaining two acts, however. Microsoft made it impossible for users to employ Windows' "add/remove" utility to remove the browser from the operating system,[143] and it commingled browser code with files that contained code that performed other functions.[144] As to these claims, the court found that Microsoft was liable for monopolization because the government demonstrated how those decisions might shore up Microsoft's market power and because Microsoft had not justified the decisions.[145] Microsoft had made "some general claims regarding the benefits of integrating the browser and the operating system" but it had not specified or substantiated those claims.[146] One wonders how much substantiation the court would require, given that this allegation concerned a design decision, and why Microsoft's testimony that its integration of code was consistent with its overall design philosophy, which one would be hard-pressed to say had no competitive benefits, was not enough.

On remand, Microsoft and the government agreed to allow OEMs and end-users to employ means such as the add/remove utility to remove Microsoft's browser from Windows.[147] Proceedings regarding commingling were more controversial. The district court rejected demands from various sources that Microsoft be ordered to separate the unlawfully integrated

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141. *Id.* (Findings of Fact 159); *id.* at 60-61 (Findings of Fact 210); *id.* at 63 (Findings of Fact 217).
142. *Id.* at 67.
143. *Microsoft IV*, 253 F.3d 34, 66-67 (D.C. Cir. 2001) (en banc).
144. *Id.*
145. *Id.*
146. *Id.*
147. *Microsoft VI*, 231 F. Supp. 2d 144, 176 (D.D.C. 2002).

code.[148] Instead, it approved the remedy to which Microsoft and the government had agreed: allowing OEMs to remove user access to Microsoft programs that might become OS substitutes (middleware) and to feature competing middleware instead. Under this remedy, the code could remain mingled, so long as the user did not have to know about it.[149]

The district court offered several reasons for not ordering Microsoft to separate the integrated code. The court noted that the government had never sought a remedy requiring the actual separation of code, but had instead focused its attention on the perceptions of end users.[150] It found that the non-settling states had not offered a coherent definition of operating system code, and thus no reliable way to separate the code from other code, a distinction necessary to enforce any remedy requiring the separation of code.[151] The non-settling states also failed to present any economic justification for a separation remedy; Professor Shapiro declined to opine on that aspect of the states' request.[152]

The district court's reasoning went beyond such deficiencies, however. It credited testimony that an order requiring Microsoft to remove code from Windows would harm the industry and consumers.[153] The court's analysis is interesting because it sheds light on the reasons for finding liability for bundling in the first place, as well as on some other aspects of the government's case. Regarding harm to the industry, the court reasoned that ordering Microsoft to separate integrated code would impede Microsoft's development of Windows and pose a risk that the Windows platform would fragment.[154] In addition, if Microsoft had to remove middleware code from Windows, the platform code base would vary depending on whether the code was replaced and, if so, what replaced the code.[155] The court also credited testimony that separation of integrated code could

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148. *Id.* at 28-30. The court specifically rejected a proposed remedy submitted by the non-settling states, which would have required that Microsoft unbundle versions of any program that bundled middleware code with operating system code. *Microsoft V*, 224 F. Supp. 2d 76, 157-59 (D.D.C. 2002).

149. *Microsoft V*, 224 F. Supp. 2d at 157-59; *id.* at 268 (App. B, Final Judgment ¶ III.C); *id.* at 270-70 (App. B, Final Judgment ¶ III.H); *see* Second Revised Proposed Final Judgment ¶¶ III.C, III.H, *available at* http://www.usdoj.gov/atr/cases/f10100/1014 6a.htm.

150. *Microsoft VI*, 231 F. Supp. 2d at 29; *Microsoft V*, 224 F. Supp. 2d at 158.

151. *Microsoft V*, 224 F. Supp. 2d at 157, 247-48.

152. *Id.*

153. *Id.* at 158.

154. *Id.*

155. *Id.* at 252-53.

produce over 1,000 variations of Windows.[156] Not surprisingly, the court believed that fragmentation would increase substantially the cost to developers of writing Windows-compatible programs.[157]

The court of appeals affirmed the district court's remedy. It too rejected demands that Microsoft be ordered to separate the relevant code, and its reasons also make one wonder why the court held that the integration of code was a basis for liability in the first place. The court of appeals agreed with the district court that the anticompetitive effects of the integration allegations centered on user perceptions, not on code aggregation.[158] It said the district court's remedy "went to the heart of the problem Microsoft had created, and it did so without intruding itself into the design and engineering of the Windows operating system. We say, Well done!"[159]

The D.C. Circuit was so complimentary in part because it took seriously the risk that a more intrusive order would fragment the Windows standard. Massachusetts, the lone state to press an appeal from the district court's rejection of its proposed remedies, claimed that the fragmentation worry was simply a different version of Microsoft's claim (in defense of effectively exclusive agreements with Internet access providers) that it needed to keep developers focused on Windows APIs rather than the APIs of some other system.[160]

This argument was not quite right—there is a difference between condemning acts that favor one's own platform to the exclusion of others and refusing to order acts that would fragment an existing platform—but there is something to this analogy. If fragmentation is bad, however, isn't standardization good? If so, efforts to increase the strength of a standard should be good, too, if for no other reason than that they reduce the risk of (bad) fragmentation. And if there is a benefit to have a firm "sponsor" the

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156. *Id.*

157. *Id.* at 254. Some commentators are skeptical that fragmentation of the OS code base would be a significant problem even if several firms offered versions of Windows, rather than simply having Microsoft offer multiple versions. *See* Robert J. Levinson et al., *The Flawed Fragmentation Critique of Structural Remedies in the* Microsoft *Case*, 46 ANTITRUST BULL. 135, 138 (2001). Some of the reasons for this view would support a skeptical view of any fragmentation, though they do not demonstrate that fragmentation is a trivial risk. One implication of this argument is that developers would absorb some of the (possibly modest) cost of making sure an application ran on all OS variants, which may explain evidence of developer opposition to the proposed un-mingling remedy in *Microsoft*. Levinson et al., *supra*, at 153.

158. *See Microsoft VII*, 373 F.3d 1199, 1207-08 (D.C. Cir. 2004).

159. *Id.* at 1210.

160. *See id.* at 1211.

adoption and maintenance of a standard,[161] then why should the sponsor be held liable for policing and strengthening the standard?

Massachusetts might answer that one may not keep developers focused on one's platform by effectively foreclosing the most efficient distribution channel, thus raising the distribution costs of potential rival platforms. It is not clear that this answer should be conclusive, however. If acts that strengthen a standard also increase rivals' distribution costs then, so long as strengthening the standard is good, the acts present a tradeoff between effects that, under the court of appeals' liability rule, should be weighed in the balance. Raising the distribution costs of rival platforms would reduce the supply of such platforms, but if fragmentation is bad then increased distribution of a rival platform is not obviously a net gain to competition. That is probably why the D.C. Circuit rejected the view that "fragmentation [is] merely competition by another name."[162]

Nevertheless, in affirming liability with regard to Microsoft's API agreements, the court of appeals said that keeping developers focused on Microsoft's Windows API's was a competitively *neutral* argument, not a procompetitive justification for the agreements.[163] This conclusion allowed the court to affirm liability without balancing the costs and benefits of the agreements, but the arguments presented above suggest that the court of appeals should have engaged in such balancing. Those arguments suggest the court judged Microsoft's defense too harshly, a point that in turn calls into question the court's decision that Microsoft could be held liable for its platform design decisions (as well as for the agreements for which the defense was presented).

Before leaving this topic, it is worth noting that one argument fell through the cracks as litigation dragged on. The district court's remedy of hiding access to Microsoft programs addressed only one aspect of the original liability findings—that novice users with access to multiple icons might generate higher OEM support costs. The "hide the icon" remedy did not address the finding that integrating code increased the testing costs of

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161. To use a phrase Professors Katz and Shapiro employ in the article Professor Williamson cited as showing an economic model beyond the power of a court to apply. Katz & Shapiro, *supra* note 32. Alan Meese suggests that keeping developers focused on Windows APIs might be a way for Microsoft to recoup costs it incurs in helping developers write for Windows. *Cf.* Meese, *supra* note 126, at 824-25 (making the suggestion in the context of exclusive dealing relationships). This idea builds on Howard Marvel's argument that exclusive dealing arrangements mimic property rights and allow one firm to recoup its investment by cooperating with another. Howard P. Marvel, *Exclusive Dealing*, 25 J. LAW & ECON. 1, 6 (1982).

162. *Microsoft VII*, 373 F.3d at 1212.

163. *Microsoft IV*, 253 F.3d 34, 71 (D.C. Cir. 2001) (en banc).

OEMs that wished to install multiple programs.[164] It would be pointless to try to assess the marginal loss (if any) from failing to address this aspect of costs. More to the point, if the district court was right about the risk of fragmentation, then the costs of an unbundling remedy would almost certainly exceed the marginal OEM testing cost. Again, this result calls into question why an increase in OEM testing costs should have created liability in the first place.

The final verdict on commingling resembles the final verdict on Java. That which was unlawful did not have to be undone, because undoing it would likely create greater costs than benefits. Those costs, however, called into question whether liability should have been found in the first place. It is very difficult to consider this result as anecdotal evidence in favor of the integration approach to error costs. It is very easy to consider it as anecdotal evidence in favor of the market correction approach.

C.   OEM License Restrictions

The district court found Microsoft liable for monopolization in part because Microsoft restricted the ability of OEMs to modify Windows in ways that promoted competitive products.[165] The court of appeals grouped these restrictions into three categories; I reduce them to two here.

In the court of appeals' first and third categories were Microsoft restrictions that prohibited OEMs from removing access (such as by desktop icons) to Microsoft's web browser and from altering Microsoft's "Active Desktop." The district court found that these restrictions were anticompetitive because they raised the cost to OEMs of pre-installing additional browsers, and thereby deterred OEMs from doing so, thus protecting Microsoft's operating system monopoly. The court of appeals agreed.[166]

Microsoft argued that these restrictions were simply valid assertions of the copyrights it held in its code. As applied to these restrictions, the D.C. Circuit said the copyright argument "borders upon the frivolous."[167] Microsoft also argued that its restrictions maintained a uniform appearance so

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164. *Microsoft II*, 84 F. Supp. 2d 49-50 (D.D.C. 1999) (Findings of Fact 159). The court of appeals mentioned the OEM cost issue but did not distinguish between user support costs and testing costs. *Microsoft VII*, 373 F.3d at 1209.

165. Specifically, Microsoft forbid OEMs from (1) removing certain things (such as icons or folders) from the Windows "start" menu; (2) modifying the initial Windows boot sequence; (3) installing software that launched automatically upon completion of the boot sequence; (4) installing icons dissimilar in size or shape to Microsoft icons; and (5) using Microsoft's "Active Desktop" to display third-party brands. *Microsoft II*, 84 F. Supp. 2d at 61.

166. *Microsoft IV*, 253 F.3d at 357.

167. *Id.* at 359.

users would know how to use Windows on any machine. The D.C. Circuit rejected this argument, as had the district court, on the ground that OEMs had an incentive not to confuse consumers because OEMs bore the brunt of user support costs.[168]

The court of appeals also said Microsoft had not "substantiated" its claim that it needed to control the user interface to avoid consumer confusion. However, it is not clear what sort of substantiation the court sought, nor why Microsoft would have to substantiate consumer user interface confusion when the government did not have to substantiate actual professional software developers' confusion, a far less intuitive claim that the court of appeals nevertheless upheld.[169] And even more disturbing, the court also said that whether icons do or do not appear did not "self-evidently affect either the 'stability' or the 'consistency' of the platform,"[170] a comment that conflates the code itself with user perceptions of the code. As noted above, in the remedy phase, the court was quite content to focus on user perceptions of the code rather than actual commingling of the code, so its elevation of code over perception on this issue is hard to understand.

As the court noted, OEMs have an incentive not to confuse consumers. At the same time, however, OEM changes to the user interface still could lower the value of that interface as a work. A consumer who works on machines from different OEMs and spends time figuring out different configurations of Windows is likely to value Windows less than a consumer who knows how Windows works every time. OEM support costs would be an imperfect proxy for diminution in the value of the interface because not all confused consumers would call an OEM for support. Some would just blame the operating system. Nothing would stop an OEM itself from blaming a problem on Windows.[171]

The court's questionable analysis on this point relates both to its stated test for liability and to the question of error cost. The court of appeals seems to have balanced the benefits of the uniformity argument against the costs of reduced OEM distribution of potential platform substitutes, but it did not say it was doing so. The court instead simply rejected a perfectly plausible (though not necessarily compelling) argument as if it was incoherent. As with allegations we have examined previously, the court used relatively categorical reasoning to dispose of arguments pertaining to very

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168. *Id.*

169. *See supra* notes 114-17 and accompanying text.

170. *Microsoft IV*, 253 F.3d at 370.

171. Trial Transcript, *supra* note 128, at 3636 (testimony of Carl Shapiro on April 15, 2002).

specific acts, thus avoiding an overt balancing of the costs and benefits of those acts.

It may not be fair to fault the court for the limits of its explanation, however, because there are fairly significant limits to the degree to which anyone may explain balancing. These limits were apparent in the court of appeals' treatment of Microsoft's second type of restriction, regarding Windows' initial boot sequence. These restrictions prevented OEMs from substituting their own user interfaces for Microsoft's or from using the initial boot sequence to promote products (such as Internet access from a provider that distributed Netscape's browser) that might threaten Microsoft's monopoly.[172] Both the district court and the court of appeals held these restrictions were anticompetitive because the restrictions effectively denied to firms such as Netscape access to the most efficient means of distributing browsers.

For the most part, Microsoft made the same arguments regarding these restrictions as it did regarding the first type of restrictions. And, for the most part, the court of appeals treated these arguments the same way: Microsoft lost. As to one argument, however, the court of appeals agreed with Microsoft's position, and it did so through explicit balancing. The court said

> We agree that a shell that automatically prevents the Windows desktop from ever being seen by the user is a drastic alteration of Microsoft's copyrighted work, and outweighs the marginal anticompetitive effect of prohibiting the OEMs from substituting a different interface automatically upon completion of the initial boot process. We therefore hold that this particular restriction is not an exclusionary practice that violates § 2 of the Sherman Act.[173]

This conclusion seems very sensible at first glance. Still, it is hard to see exactly why the court reached it. The court does not explain how it has measured the "marginal anticompetitive" effect of substitute interfaces, nor how one could weigh that effect against Microsoft's legal interest in avoiding "drastic alteration" of Windows. The court seemed to give weight to precedents holding that substantial alteration of copyrighted works is infringement, but it also distinguished those cases on the ground that they did not involve antitrust claims.[174] That distinction applies across the board, however, and it is hard to see how a court could possibly weigh

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172. *Microsoft IV*, 253 F.3d at 61-62.
173. *Id.* at 63.
174. *Id.*

a legal interest in the integrity of a work against the economic concept of an increase in the distribution costs of rival firms.

In addition, the court's distinction between "drastic" alterations of a work, which even a platform monopolist may prevent, and non-drastic alterations, which a monopolist may not prevent on pain of section 2 liability, is unclear. We know that OEM substitution of interfaces is a drastic alteration and that prohibitions on meddling with icons or start menu folders are not drastic, but we do not really know why. The court's rejection of Microsoft's user interface uniformity argument might imply that the notion of a drastic alteration refers to alterations to the code itself, rather than what the user perceives, but the court did not say that substitution of interfaces altered the Windows code, and the most obvious consequence of interface substitution is that consumers will not know whose operating system they are using—an issue of perception, not code.

The remand proceedings provided a more concrete basis for questioning this aspect of the decision. The non-settling states proposed that Microsoft be forbidden from preventing a third party supplier of computers (such as AOL) from displaying a non-Microsoft desktop so long as the third party provided on that desktop a way for consumers to display the Windows desktop.[175] The district court rejected this proposal, citing the portion of the court of appeals' decision quoted above, but neither court ever really analyzed whether the costs of allowing other firms free reign to substitute desktops, thus allowing them to market a wide variety of computers, exceeded the gains from allowing such freedom.[176] The court of appeals simply proclaimed that it had balanced seemingly incommensurable considerations and found that Microsoft's legal interests outweighed whatever benefits might come from OEM interface substitution. The district court simply cited this proclamation. QED.

Against all this, one could argue that it is unfair to criticize the court's balancing because it is obvious that Microsoft should have the legal right to prevent an OEM from such drastic alteration of Microsoft's work. Common sense seemingly compels the conclusion that Microsoft should be allowed to insist that users look at an interface that tells them whose

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175. *Microsoft V*, 224 F. Supp. 2d 76, 195 (D.D.C. 2002); Plaintiff Litigating States' Remedial Proposals at 9 (proposed text for ¶ 2.c.iii), *Microsoft IV* (No. 98-1233) [hereinafter States' Remedial Proposals], *available at* http://www.naag.org/issues/microsoft/pdf/011207-states-remedy.pdf.

176. This proposal could be criticized on the ground that it contemplated competition within the Windows standard, as opposed to competition in the operating systems market generally, so that any gain to competition would probably be slight. However, that is not the way the court of appeals framed the argument.

operating system they are using. The point is not wholly obvious, however. Microsoft could still pay OEMs not to substitute other interfaces for its own, producing an auction in which OEMs rather than Microsoft reaped returns from the valuable real estate of the first desktop screen. Maybe such bidding would constrain Microsoft's ability to foreclose the OEM distribution channel (though if rivals have to bid against Microsoft for desktop space their costs might be as high under a bidding regime as they were in light of the conduct for which Microsoft was held liable). Such bidding might only benefit OEMs at Microsoft's expense, of course, but one could say the same of the remedy adopted on remand.

In fact, the consent decree Microsoft and the Justice Department negotiated allows Microsoft to give OEMs consideration[177] to promote Microsoft products so long as the consideration is commensurate with the absolute amount of OEM support and does not discriminate against OEMs that promote rival technologies.[178] This provision is of questionable benefit to the non-settling states. The nondiscrimination restriction tempers the effect of such benefits somewhat, but even though Microsoft could not discriminate among OEMs based on their support for rival technologies, an OEM that wanted to support a rival instead of supporting Microsoft would have to forgo Microsoft's compensation. An OEM making that choice would incur an economic cost in the amount of the compensation it otherwise would have received. A rival that wanted to use an OEM to distribute its products presumably would have to compensate the OEM for that cost, which would in turn raise the rival's costs relative to a world in which Microsoft was forbidden from offering such inducements.[179]

In explaining why this provision was acceptable, the district court noted that the court of appeals had insisted that even a monopolist could compete by offering its product at an attractive price, a concept that included technical information and other support in addition to cash.[180] Threats to withhold such benefits, however, were unlawful. Thus under the decree the court approved,

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177. A term defined broadly to include "any monetary payment or the provision of preferential licensing terms; technical, marketing, and sales support; enabling programs; product information; information about future plans; developer support; hardware or software certification or approval; or permission to display trademarks, icons or logos." Second Revised Proposed Final Judgment, *supra* note 149, § VI.C.

178. *Id.* § III.A.

179. Indeed, in the liability phase the district court found as a fact that some OEMs view desktop positioning as an opportunity to reap bounties from software firms. *Microsoft II*, 84 F. Supp. 2d 9, 60 (D.D.C. 1999).

180. *Microsoft V*, 224 F. Supp. 2d at 164.

> Microsoft will be permitted to provide compensation for OEM action which promotes or supports Microsoft products, but Microsoft cannot withhold such consideration or other consideration based upon OEM action which tends to favor non-Microsoft products. While these two goals may appear to be somewhat at odds, the liability in this case all but demands this level of hair-splitting.[181]

The court of appeals did not dispute that, from an economic point of view, this distinction is very fine indeed. Instead, the court described the provision as a matter of choice. The remedy gave OEMs the choice "either to distribute non-Microsoft middleware or to get a discount from Microsoft."[182] One could question how much of a choice this really was. In the liability phase, both the district court and the D.C. Circuit had stressed that OEM profit margins were very small, which was one reason why Microsoft's integration of code and restrictions on altering the desktop were unlawful.[183] The courts also stressed that installing more than one version of a program such as a browser tended to increase OEM costs.[184]

These facts suggest OEMs would be hard pressed to turn down Microsoft's offers, and would be unlikely to pre-install duplicative programs unless the producer of such programs offered similar incentives (raising the producer's distribution costs relative to a world in which OEMs might not demand such payments). The choice the court emphasized therefore may be more apparent than real, leading again to the inference that the conduct should either be declared lawful (my view) or subjected to stronger remedies.

As Professors Salop and Romaine suggested,[185] balancing is the method that best implements the integration approach to error costs. However, analysis of the OEM licensing arguments demonstrates that implementing the integration approach through balancing leads more to arbitrariness than precision or, if one prefers, achieves the appearance of precision through subjective decisions about whether to balance or how to balance. To the extent these allegations call into question the integration approach, they support the market correction approach.

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181. *Id.*
182. *Microsoft VII*, 373 F.3d 1199, 1227 (D.C. Cir. 2004).
183. *See supra* text accompanying notes 139-41.
184. *Id.*
185. Salop & Romaine, *supra* note 6.

D.   The F/OSS Remedies Arguments

For the most part, the claims discussed so far looked backwards at things that had already happened. The debates were about whether courts should condemn what had happened as a violation of the antitrust laws and, if so, what measures would best remedy the violation. This retrospective analysis did occur in the context of theories predicting how competition might have developed had the conduct not occurred, and in that sense one might say there was a prospective element to them. However, the nub of the claims involved the type of retrospective analysis that characterizes most litigation.

In this Section, I examine some explicitly forward-looking claims the government advanced in connection with its proposed remedy. These claims rest in part on aspects of F/OSS production the government saw as desirable. I relate these claims to the error cost debate by testing the soundness of the government's reasoning about F/OSS development.

As noted, the government asked Judge Jackson to split Microsoft vertically into two firms, an applications firm and an operating systems firm, which he did. Though the remedy did not survive appellate review, the government's justification for its proposed remedy is notable for the appearance of the GNU/Linux OS. According to the government, the separate applications firm would have had an incentive to make its applications work on any operating system, thus broadening its market and creating a situation where a consumer's desire to have a full range of applications did not limit the consumer to a single operating system such as Windows.

Professor Carl Shapiro agreed that such a breakup would help increase competition in the operating systems market. He cited Apple's MacOS and GNU/Linux as examples of operating systems that might compete more robustly with Windows if Microsoft were split in two.[186] The MacOS is, of course, owned and controlled by Apple, which would have to earn a profit on its work in order to keep producing it. As noted in Part II.C, GNU/Linux is licensed under the GPL, which means any licensee may distribute the code, modify it, and distribute the modifications, so long as the licensee allows others to do the same with its own work. GNU/Linux's status as F/OSS, licensed under the GPL, distinguishes it from the MacOS in two potentially significant ways. The first distinction has to do with pricing, and the second with the risk of strategic behavior.

Professor Shapiro noted the first distinction in his declaration. One could object to the government's vertical divestiture proposal on the

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186. Declaration of Carl Shapiro April 28, 2000 at 3, *Microsoft V* (No. 98-1233).

ground that if we wound up with one dominant application firm and one dominant operating system firm, the government would have created a double-marginalization problem, thus raising prices relative to a world in which the two firms were integrated (as is the case with Microsoft). An antitrust remedy that raises consumer prices is on shaky ground. Professor Shapiro anticipated this objection, however. He testified in his declaration that "as a theoretical matter this concern is very likely outweighed by the lowering of entry barriers into operating systems that the reorganization will cause, especially when one considers nonprice as well as price considerations, specifically the innovation that will be stimulated by the reorganization."[187] He footnoted the point by saying "consumers stand to benefit as a cheaper operating system, namely Linux, becomes more attractive."[188]

Certainly the cost of operating systems could go down if the GNU/Linux OS became a viable substitute for Windows. The GPL gives any licensee the right to redistribute the code, and that is bound to constrain the price any vendor can charge. Moreover, the reduction in the price of operating system code could be greater than any price increase due to double marginalization, thus yielding a net benefit to consumers.

This analysis fails to capture some aspects of the F/OSS model, however. For example, the GPL allows anyone to modify GNU/Linux code and distribute modified versions of the code. If the GNU/Linux code base were to fork into different versions, users would face several important questions. Is the code backwards compatible with previous versions, for example, or has the copy you acquire been altered in a way you are not competent to detect? The risk of forking has parallels in Unix development, the Java allegations in the case itself, and near-misses in the history of GNU/Linux.[189]

Uncertainty, and the rational reluctance of ordinary consumers to monitor F/OSS development practices, has led to the emergence of firms such as Red Hat, which sell branded versions of Linux, employing trademark rather than copyright as the intellectual property right most relevant to competition.[190] Importantly, however, these firms also sell consulting services and support that help firms tailor Red Hat Linux for particular purposes and maintain their Linux installations.[191] The GPL does not apply to the sale of consulting services or support. Nothing stops a firm such

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187. *Id.* at 15.
188. *Id.* at 15 n.25.
189. *See supra* Parts II.B and II.C.
190. *See, e.g.*, WEBER, *supra* note 60, at 108, 199-201.
191. *Id.*

as Red Hat or SuSe from selling such services on per-server basis, which is in fact Red Hat's business model.[192] On this model, a customer that purchased one copy of (for example) Red Hat Linux and copied it over to 9,999 machines, as Google does, might receive support for only one machine. It would have to pay for the other 9,999 copies to obtain support for the full installation. It is therefore possible that even if GNU/Linux entered the Windows market, and the proportion of the total cost of computing attributable to the code itself went down, the total cost of computing including complementary services might go up (or down, or stay the same).

One might argue that this possibility is so far-fetched that, properly discounted, it does not amount to much. The history of antitrust intervention in markets related to general purpose computing gives us no reason to be sanguine on this score, however. As Part II shows, the government has consistently been behind the curve of technology, and its most significant effects have been unintended. Because the government's track record gives no reason to have confidence in such predictions, it is fair to ask why that track record should be disregarded with respect to this prediction. If it should not be discarded, it justifies a fair degree of skepticism.

The government's somewhat tentative endorsement of GNU/Linux as a cure for the double marginalization risk did not discuss the risk of a fork in the GNU/Linux code base. The risk of forking was discussed, however, in connection with the second appearance of F/OSS development practices. The non-settling states proposed a remedy requiring Microsoft to release the source code to Internet Explorer and license that code on open-source terms.[193] The states argued that much of Microsoft's alleged misconduct was designed to make Internet Explorer the dominant browser, so a remedy for that misconduct should deprive Microsoft of the dominance it had unlawfully acquired.[194]

Microsoft attacked the remedy on the ground that open-source projects are vulnerable to forking and fragmentation, which could reduce the utility they offer both developers and consumers. Professor Shapiro agreed that

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192. Red Hat's 2004 10K states:

> We have created a business model based on a suite of enterprise software products and technology-based systems management services (Red Hat Enterprise Linux and Red Hat Network), which are developed as open source technologies. We sell these technologies and services to our customers in the form of annual subscriptions on a per-server basis.

Id. at 3.

193. States' Remedial Proposals, *supra* note 175, at 17 (proposed text for ¶ 12). The proposal did not specify which of the licenses the states had in mind, if any, but the parties argued as if the GPL were the model.

194. *Id.* at 28 (proposed text for ¶ 19).

open-source projects need to be managed and coordinated to combat fragmentation. He testified that it would be desirable for Microsoft to act as the maintainer or coordinator of the proposed Internet Explorer open-source project,[195] though the remedy proposed by the non-settling states did not provide for such a role. This testimony captured the difficulties the government encountered in *United States v. Microsoft Corp.* The question of maintaining Internet Explorer as an open-source project exemplified the degree to which the government's case rested on an attempt to calibrate precisely the manner in which Microsoft could serve as a maintainer of a standard that, as a standard, was socially valuable, without going too far, as that notion might be measured by some metric as to which opinions will necessarily vary. Good luck.

The district court refused to order that Microsoft release Internet Explorer under an open-source license. It believed this remedy was not tied to Microsoft's liability because the remedy aimed to help operating systems vendors rather than middleware providers.[196] That argument missed the idea that it was platform competition that mattered, not the level at which that competition took place. The court of appeals was not concerned with this point, however, concluding that it was within the district court's discretion to be satisfied with re-opening distribution channels. Referencing its own two-tiered approach to causation, the court of appeals said the district court properly applied more stringent standards to what it reasonably viewed as a structural remedy (effective divestiture of Internet Explorer as a program) than it would apply to other sorts of remedies.[197]

The second difference between the GNU/Linux OS and ordinary proprietary systems such as the MacOS has to do with the risk of strategic behavior. As the Netscape allegations began to wither, the Microsoft litigation turned into a kitchen-sink style examination of Microsoft's allegedly strategic behavior. The costs and benefits of such behavior can be very hard to assess, leading some to favor measures that eliminate the need for such assessment by eliminating the risk of such behavior. One could argue that the rights the GPL grants to licensees would be one method by which strategic behavior could be constrained.[198] After all, if

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195. Trial Transcript, *supra* note 128, at 3539-40 (testimony of Carl Shapiro on April 15, 2002).

196. *Microsoft V*, 224 F. Supp. 2d 76, 242-43 (D.D.C. 2002).

197. *Microsoft VII*, 373 F.3d 1199, 1228-29 (D.C. Cir. 2004).

198. In congressional testimony regarding remedies in the *Microsoft* case, for example, Professor Lessig opined that free or open-source software "is unlikely ever to pose any of the same strategic threats that closed source software does." *The Microsoft Settlement: Hearing Before the Senate Committee on the Judiciary*, 108th Cong. (2001) (testi-

anyone can modify and redistribute your code, how could you use it strategically?

It is possible that open-source projects would turn out to present fewer risks of strategic behavior than proprietary projects, but the point is not obvious. The history of competition in markets related to general-purpose computers and the D.C. Circuit's acquittal of Microsoft's Java development efforts both give reason to suspend judgment on this claim. To take the second point first, if it was legal for Microsoft to fork Sun's Java technologies, then presumably it would be legal for Microsoft to fork an open-source project such as the GNU/Linux OS. Under the GPL, Microsoft would have the right to modify and redistribute the GNU/Linux code, so long as it provided the source code to its modifications and allowed others to modify and redistribute them, too. Because licensees could copy and redistribute Microsoft's improvements, Microsoft would not make much money on them. Still, the history of Unix and Java suggests that the risk of a significant fork in the code would itself deter adoption of the entrant system.

No doubt one could make various arguments to distinguish this hypothetical case from Microsoft's modifications of Sun's Java technologies, but it is not clear whether such arguments would work, especially if Microsoft could point to efficiencies in its version of the GNU/Linux OS. The court of appeals' rule seems too weak to combat such behavior, while its rulings on related issues, such as distribution agreements, seem too strong. There is no reason to expect the unhappy equilibrium of the Java aspects of *United States v. Microsoft Corp.* to get any better just because an open-source project comes into the picture.

Perhaps more to the point, development of the GNU/Linux OS *is* currently driven by strategic concerns. That development is being backed by firms, such as IBM and Red Hat, which would profit from a commoditized operating system platform.[199] From this perspective, the government's endorsement of GNU/Linux in connection with its initial remedy proposal constitutes endorsement of a particular strategy, not a path to avoid strategic behavior. It is ironic that this strategy is being pursued aggressively by IBM, the firm the Justice Department spent half the 20th Century worrying about, and that the origins of the strategy can be traced to a development model that emerged in part as the unintended consequence of a consent decree aimed at different conduct. But it is a strategy just the same.

mony of Prof. Lawrence Lessig, Stanford Law School), *available at* 2001 WL 1580448 (F.D.C.H.).

    199. *E.g.*, WEBER, *supra* note 60, at 199-200.

The history of governmental involvement in these markets provides little reason for optimism regarding what seems to have been its implicit endorsement of F/OSS production methods.

IV.   CONCLUSION

Holmes famously said the life of the law has been experience, not logic.[200] Canonical though it is, something about this comment grates on the academic mind. First, experience is varied and subjective, not rigorous and scientific. Different people experience different things differently, and they draw different lessons from similar experiences. Law professors and judges certainly have no monopoly on experience. It is not even clear that they have a comparative advantage over ordinary people in distilling useful lessons from experience. Decisions grounded only in such a highly subjective and debatable concept as experience will appear biased—at least when compared to modus ponens or modus tollens—and unsophisticated, compared to a mathematical proof. Second, and perhaps most damning of all, experience looks backwards, not ahead, making it seem a weak foundation for law, which must change as the society law regulates changes.

For these and related reasons, it is difficult to mount an analytically rigorous defense of the claim that experience should trump logic. In the context we have assessed here, Professor Williamson was right to assert that the law should look forward and do its best to evolve, rather than look backward and refuse to change. He was right to imply that such a refusal had to be explained by something other than economic logic, making it vulnerable to attack as more an ideological than an economic stance. Professor Williamson and Professors Salop and Romaine were quite right to insist that logic both demands and accommodates the integration of error cost analysis into the more general analysis of allegedly anticompetitive conduct.

If one can defend Holmes on normative grounds as well as historical ones, however, then the logical shortcomings of the market correction approach to error costs do not compel its rejection. The analysis of this Article suggests a few lines of defense, which in turn imply a recommendation for improving the D.C. Circuit's standard for monopolization liability.

The first line of defense is to deny that there is a non-ideological position in this debate.[201] It is true that a certain degree of libertarian thought

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200.   OLIVER WENDELL HOLMES, JR., THE COMMON LAW 1 (1881).

201.   *See* Andrew Gavil, *Exclusionary Distribution Strategies by Dominant Firms: Striking a Better Balance*, 72 ANTITRUST L.J. 3, 30 (2004) ("How one strikes the balance

runs through the arguments for the market correction approach, but it is also true that a certain degree of faith in governmental (including judicial) administration and regulation of markets runs through the integration approach. Indeed, some of the appeal of the integration approach probably stems from the mathematical aesthetics of equilibrium analysis, which is a far stronger force in economic analysis of the law than is commonly admitted. One might argue about how to characterize this appeal, but for present purposes we may treat it as simply a variant ideology with a disturbingly utopian view of how well judges can run an economy.

Even when courts say they are balancing costs and benefits, the almost-always-lacking data are replaced with something, generally with bets and presumptions, which are not derived from abstract logic. For this reason, it would be wrong to cast the error cost debate as being between logic and ideology. It is a debate over how to interpret antitrust experience and the degree to which such experience should temper abstract logic. As noted earlier, as an abstract matter, the domain of decision-theoretic cost-benefit analysis is unlimited. No rule of logic forbids antitrust courts from stamping out market power by determining the price of every transaction. To the extent cost-benefit analysis or decision theory precludes such a result, it is only because experience provides information that, when plugged into the equation, draws boundaries.

Debates over decision theory, and thus the integration approach, therefore will either be too abstract to be useful or will be influenced by debates over what lessons should be drawn from history and how those lessons should influence future analysis. Because the integration approach and the market correction approach differ even though it is theoretically possible for them to coincide, one must explain the difference. Logic does not do the job, suggesting that ideology must play a role.

If I am right about these points, then the market correction approach is not discredited by the fact, which I concede, that there is an ideological aspect to it. That aspect is a constant in this debate, and therefore cannot distinguish between competing positions. On what ground, then, should the choice be made? Here I claim two comparative advantages for experience over logic.

First, though one cannot prove the future will be like the past, when one looks at both the history in Part II and the opinions in *United States v. Microsoft Corp.*, one sees a fairly damning indictment of the Justice Department's monopolization theories. With respect to the general history of

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between error costs—between over- and under-deterrence, for example—may be more a product of viewpoint than hard economics.").

this market, the Justice Department either accomplished nothing or, depending on how one views the Unix experience, accomplished nothing that was intended, which amounts to the same thing for present purposes.

With respect to the *Microsoft* litigation, the verdict is that it produced nothing good. At tremendous expense, it produced analytically shaky precedent (the foundations of which were called into question by the evidence in the remand proceedings) that satisfies no one. On my view, the opinions condemn conduct without providing any reason to believe that the conduct extended Microsoft's market power. That the remedies were toothless only mitigates the harm. On the view of analysts with more interventionist instincts, the court condemned some conduct that harmed competitors but excused conduct that caused them far more harm, and exacerbated that failing by accepting a toothless remedy. Either the case should not have been brought or it should have been pursued to the end of the premises that justified bringing it.

Second, when the past looks like the history surveyed in Part II, it is fair to ask what reason there is to expect it to get better. The natural answer is that economic analysis is more sophisticated than in the past, as is our understanding of the limitations of the courts. Exactly the same answer, in other words, which would have been given in 1949, 1956, 1969, or 1982. There is no particular reason to have faith that this answer implies good future results, and significant reason (based in experience) to discount it severely. Experience trumps logic because law is applied, not abstract. One cannot get by in the real world by ignoring what happens there.

The problem with such arguments, of course, is that they do not meet the most serious objection to the market correction approach, which is Professor Williamson's point that one cannot make progress if one looks only at the past. He was right, and no amount of quibbling will change that. If we are to reconcile this fact with the unhappy history that goes along with it, we need a doctrinal tool that leaves room for new learning but demands a high degree of certainty that applying that learning will enhance competition in the real world.

My suggestion is to reverse the D.C. Circuit's causation analysis in *United States v. Microsoft Corp.* That is to say, at least where the government or a private plaintiff does not challenge the legality of an initial market position, monopoly maintenance liability should not attach unless the government or a private plaintiff can prove that the acts in question prolonged a defendant's market power past the point at which that power would have eroded significantly had the acts not been taken. Once that point is proved, however, the defendant should suffer real pain. I am will-

ing to bet that evidence sufficient to meet such a rigorous standard will also provide guidance for adopting a cogent remedy.

Notions of finely balanced liability findings and finely tailored remedies are as impractical in the real world as they are elegant in theory. The traffic cop should be retired, and the SWAT team should be called in only when strong medicine is plainly warranted. That is the lesson of *United States v. Microsoft Corp.*