

EVALUATING THE LITIGATING STATES' PROPOSED REMEDY FOR MICROSOFT:

Aiding Rivals at Consumers' Expense

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I. INTRODUCTION

Nine states (plus the District of Columbia) have rejected the settlement worked out by Microsoft, the Department of Justice, and nine other state attorneys general in the landmark case, *U.S. v. Microsoft Corporation*. But the remedy they propose in place of the settlement is deeply flawed.¹ Much of it has nothing to do with the acts found to be anticompetitive by the Court of Appeals for the District of Columbia Circuit.² Indeed, some provisions address issues that were never part of the original lawsuit. Their “remedy” would mandate conduct remedies that would be difficult to implement technically and would gratuitously damage Microsoft’s business. And it is crafted to benefit Microsoft’s strongest and most vocal rivals rather than competition as a whole.³ One of the most damning flaws in the litigating states’ proposed remedy is its disregard for consumers’ interests. In fact, many of its provisions would cause consumers considerable harm.

My goal here is not an exhaustive review of the proposal. Instead, I consider key provisions in depth, taking the ramifications of those provisions to their logical conclusions to illustrate their harmful effects on consumers. Of course, no one can predict with any certainty how the computer industry will evolve in coming years. So, to help clarify the litigating states’

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¹ This paper analyzes the Plaintiffs’ First Amended Proposed Final Judgment (referred to henceforth as “plaintiffs’ proposal.”).

² *United States v. Microsoft*, 253 F.3d 34 (D.C. Circuit 2001).

³ See Robert W. Hahn, “The Litigating States’ Proposed Remedy for Microsoft: Antitrust As A Substitute For Competition,” AEI-Brookings Joint Center For Regulatory Studies, Related Publications March 2002, available at <http://www.aei.brookings.org/publications/related/states.pdf>.

proposal, I offer a thought experiment that highlights just how much harm their “remedies” would have inflicted on software consumers if they had been imposed ten years ago—the length of time the remedy would be in effect if adopted by the court. I find that the plaintiffs’ proposal would have drastically reduced Microsoft’s incentives to innovate and invest in its operating system Windows, its browsers Internet Explorer and MSN Explorer,⁴ and its Office application suite. More generally, innovation in the industry as a whole would have suffered and software prices would probably have been higher.

II. INTERPRETING THE LITIGATING STATES’ PROPOSED REMEDY

I focus on several of the litigating states’ proposed conduct remedies that have serious implications for two of Microsoft’s primary products: Windows (including Internet Explorer) and Office. Below, I briefly describe the plaintiffs’ proposal and outline its likely effect.

A. Broken Windows

The litigating states’ proposal would severely undermine Microsoft’s incentives to develop the Windows operating system. Several terms work towards this end, including a prohibition on “binding” “middleware” code to the operating system, regulating pricing in a manner divorced from business considerations and consumer value, and giving away large amounts of the intellectual property embodied in Windows. Each of these provisions would damage Microsoft’s ability to compete; taken together they would be devastating. Consumers would bear the consequences in the form of decreased competition, decreased innovation, and potentially higher software prices.

1. Mandating a New Operating System

The litigating states’ proposal would require Microsoft to redesign Windows in a way that allowed licensees, notably computer makers, to remove (“unbind”) the code for any software feature that could possibly be defined as “middleware”—without affecting the

⁴ MSN Explorer is primarily a means to access Microsoft’s Internet service, MSN, and provides Web browsing by relying on the capabilities of Internet Explorer.

performance of the rest of the operating system.⁵ Because the litigating states' definition of "middleware" is so broad, almost any piece of software could be tagged for removal.⁶ To comply, Microsoft would have to create an entirely new modular operating system that combined thousands of separate, self-sufficient components.⁷ Licensees would be entitled to exclude any combination of individual modules, while Microsoft would have to guarantee that every remaining module functioned as designed. Moreover, these licensees would still be able to call the resulting hybrid product "Windows."⁸

Under the litigating states proposal, a licensee⁹ would be at liberty to exclude any component (or combination of components) it wished and developers would no longer be able to count on the presence of key segments of software code (application program interfaces, or APIs) used by their application programs. Indeed, to ensure that their software worked

⁵ Plaintiffs' proposal, at 6. Throughout this paper, I rely on the litigating states' definition of terms such as "browser," "middleware," "technical information," "interoperate," and so forth. In general, the litigating states have extremely broad definitions of these terms.

⁶ The litigating states' definition of middleware covers almost every kind of software. It includes "without limitation Internet browsers, network operating systems, e-mail client software, media creation, delivery and playback software, instant messaging software, voice recognition software, digital imaging software, the Java Virtual Machine, calendaring systems, Handheld Computing Device synchronization software, directories, and directory services and management software." In fact, the only kinds of software specifically exempted are "disk compression and memory management software." Plaintiffs' proposal, at 36-37.

⁷ Because each module that covered a "middleware" function would have to be self-sufficient and completely removable, it is highly likely that the new operating system would contain large amounts of duplicative code. Designing a modular operating system of this type that performed as many functions as Windows currently does with its millions of lines of code would be both costly and extremely difficult. It would clearly take longer to accomplish than the six months allowed by the litigating states, and could well take years. While the litigating states' proposal allows for extensions to the six-month timeframe, their decree would be extended by the same increment as the extension. For example, if it took Microsoft five years to create the new modular operating system, the remedy would remain in effect for 15 years (the original ten years plus the five-year extension).

⁸ Every version of Windows could be marketed as "Windows" without distinguishing what pieces of code were missing. If a total of n middleware products were defined, then 2^n versions of Windows could be offered to consumers (assuming a "base" operating system module that was not considered middleware under the litigating states' definition). Under the litigating states' proposal, n could range from roughly 10 (interpreting the definitions narrowly) to thousands (treating every Windows API as a separate piece of "middleware"). If $n=10$, the number of potential Windows versions (for each of Windows Me, Windows 2000 Professional, Windows XP Home, and Windows XP Professional) would be 1,024.

⁹ The litigating states define "licensees" as anyone offering to purchase and redistribute or use internally at least 10,000 licenses for a product or combination of products; plaintiffs' proposal, at 39. Under these generous terms, Microsoft's larger competitors could easily qualify as a licensee. A rival could then order the minimum 10,000 copies and give them to a third-party reseller for distribution.

properly, developers would have to provide those features themselves (raising their own costs) or obtain the code supporting those APIs for separate distribution to consumers.

While the binding provision seems to increase choice—consumers could choose from multiple versions of Windows—the reality is that end-user choice would not be substantially enhanced. Offering a version of Windows that simply has some Microsoft “middleware” removed hardly expands consumer choice. Moreover, OEMs are already free to—and do—install “middleware” that competes with functions built into Windows. Examples include Web access software and browsers, media players and instant messaging software.

The proposed settlement, which Microsoft has already agreed to, already requires Microsoft to make it possible to hide all “middleware” integrated into Windows.¹⁰ A modular version of Windows would not increase choice of “middleware” more than the proposed settlement would. Indeed, the litigating states’ proposal is inferior from a consumer-choice perspective since computer makers and other distributors—not consumers—would decide which “middleware” was to be included with Windows. While the new-PC distribution channel is quite competitive, and therefore sensitive to consumer needs, keep in mind that Microsoft competitors (such as AOL Time Warner) would be free to pay computer makers to feature its “middleware” exclusively—but Microsoft would not.

Consumers would face higher costs as well.¹¹ If software companies did not provide key APIs with each application, consumers would have to install separate pieces of code to get their application programs to run properly – much the way they were once obliged to download “plug-ins” to get their browsers to work on some Web sites. If users had questions regarding software performance, Microsoft or the computer maker fielding the support call would have to ask multiple preliminary questions just to determine which version of Windows was installed on the computer. In the end, consumers would pay for the fragmentation of the Windows

¹⁰ United States v. Microsoft, Civil Action No. 98-1232 (CKK) and New York v. Microsoft, 98-1233 (CKK), Second Revised Proposed Final Judgment, February 27, 2002, § H.1.

¹¹ Other provisions in the plaintiffs’ proposal would reinforce this outcome. For example, the litigating states would prohibit Microsoft from entering Marketing Development Agreements (MDAs) or offering individual discounts to OEMs. Plaintiff’s proposal, at 9-10. But, in addition to being evidence of robust competition, arrangements like these are an important route to lower prices and higher quality for consumers.

platform in the form of increased confusion, increased hassle, decreased customer support and decreased choice. The fragmentation would also undermine what economists call “network” benefits—the ease of use that goes with the capacity to share files and to work with standardized software.

2. Imposing Price Controls

The litigating states’ remedy would entitle a licensee to a discount for each piece of excluded “middleware.” But the formula for the discount would not be based on any notion of consumer value. Instead, the formula would dictate that discounts equal the relative development costs for that piece of code.¹² If a Microsoft programmer wrote the code for a highly desirable piece of software in just a few days, the discount for omitting that code would be relatively small. If, on the other hand, it took several months to create software of minor value to consumers, the discount for omitting that code would be much larger. And, of course, in reality there would be no savings for Microsoft when a computer manufacturer deleted code from Windows before installing the operating system on a new computer.

Aside from its lack of an anchor in economics or business fundamentals, the litigating states’ pricing formula presents two daunting problems. First, software is often created by design teams working on multiple components of a program in unison. Assigning the “development costs” for any one piece of code would thus be arbitrary. Licensees would end up arguing that the “middleware” they wanted to exclude deserved a larger discount. Implementing the discounts would therefore involve considerable controversy and probably require a great deal of court oversight. Courts would start to look like public utility regulators.

A more serious problem, though, arises from the fact that mechanistic pricing of this sort would make it difficult for Microsoft to compete. Under the litigating states’ proposal, virtually any feature that appealed to end-users could be classified as middleware. And once a feature was thus classified, licensees would be able to remove it from the system and receive a

¹² The maximum total discount would be 25 percent. If, however, Microsoft offered the middleware for sale separately, such as for use by customers who obtain a version of Windows that omits it, then the discount would be determined by the separate distribution “price” and the total discount would not be capped at 25 percent. Plaintiffs’ proposal, at 7-8.

discount. For example, the version of Windows that included Microsoft's Media Player would have to be priced higher than the version without that "middleware." But the industry leader, RealNetworks, could continue to offer versions of its media player for free. RealNetworks could even pay computer makers to feature RealOne exclusively. Under these circumstances, they would have little or no reason to license a version of Windows containing Media Player. As a result, the litigating states' binding and pricing proposal would significantly distort Microsoft's incentives to include software features in Windows. The extremely high development costs to create a new modular operating system combined with the limited ability to compete once the new system was completed would effectively eliminate the company's incentives to develop new features for the operating system.

3. Requiring Intellectual Property Disclosures

Other provisions in the plaintiffs' proposed remedy would require Microsoft to reveal to competitors significant amounts of the intellectual property embedded in Windows. For example, Microsoft would have to disclose "all APIs, Technical Information and Communications Interfaces" needed to permit rival "middleware" to "interoperate" with Microsoft software.¹³ The litigating states' definition of "interoperate" includes getting Windows applications (whether from Microsoft or other software makers) to work with non-Windows operating systems. The "technical information" that Microsoft would have to provide to promote this type of interoperation includes "reference implementations" of all Windows APIs—that is, source code showing competitors how to implement the APIs so they could be implemented on non-Windows operating systems. In other words, this definition of "interoperate" would force Microsoft to provide sufficient information to clone Windows or Windows features. Under the states' proposal, therefore, competitors would be free to violate Microsoft's copyrights without breaking any law.

In addition, Microsoft would have to allow "qualified representatives" of PC manufacturers, independent software developers, hardware vendors, Internet access providers, Internet content providers, and other "Third-Party Licensees" to "study, interrogate and interact

¹³ Plaintiffs' proposal, at 13-14.

with the source code and any related documentation and testing suites of Microsoft Platform Software.”¹⁴ As with other definitions in the proposed remedy, the litigating states broadly interpret “third-party licensees.” Anyone agreeing to redistribute or to use a minimum of 10,000 copies would qualify as a licensee.¹⁵ This would be an easy threshold for Microsoft’s larger rivals to cross, so they, too, could gain access to Microsoft’s source code simply by claiming that access was necessary to achieve “interoperability” with one of their products.

Whatever incentive to develop Windows that the software binding and pricing rules did not kill off, the intellectual property disclosure requirements would. While it might take a bit of time to do, cloning Windows would cost a fraction of what Microsoft invested in creating and improving the operating system. Competitors, not needing to recover substantial R&D expenditures and facing near-zero marginal costs (the norm for software production), could offer their versions of “Windows” for next to nothing. Even if competitors chose not to clone Windows, they could mimic popular Windows features in existing platforms. Microsoft would be unable to count on a profitable return to its future development efforts since it could not guarantee that new features would remain unique attributes of Windows, contributing to the licensing revenues from the operating system. The bottom line: Microsoft would have little reason to continue the development of Windows.¹⁶

B. Shuttered Browsing

The litigating states’ remedy calls for Microsoft to license Internet Explorer (IE) and MSN Explorer as “open source” software.¹⁷ In other words, the company would be obliged to make public all of the source code—and at a zero price.¹⁸ That code then could be used,

¹⁴ Plaintiffs’ proposals, at 14. “Microsoft Platform Software” is defined as operating systems and broad categories of middleware, so it would seem to encompass all of Microsoft’s major products; plaintiffs’ proposal, at 37.

¹⁵ Plaintiffs’ proposal, at 39.

¹⁶ As Jean-Jacques Laffont and Jean Tirole observe, “the regulated firm may refrain from investing in the fear that once the investment is in place, the regulator would pay only for variable cost and would not allow the firm to recoup its sunk cost.” Jean-Jacques Laffont and Jean Tirole, *A Theory of Incentives in Procurement and Regulation* 53-127, MIT, 1993, at 54.

¹⁷ Plaintiffs’ proposal, at 19.

¹⁸ Along with the requirement to give away source code, the litigating states would require Microsoft to assist competitors in understanding the source code with the goal of modifying it. Even ardent supporters of open

redistributed or modified at will, with no compensation to Microsoft. Any future modifications or enhancements Microsoft made to the Web browsing features in Windows would have to be released as they were developed, for the full ten years the remedy was in effect.

If Microsoft were forced to share all of its existing and future Web browsing code without compensation, it could not recover the costs of developing the software. Giving Web browsing software away for free is not inherently uneconomical—both Microsoft and Netscape distribute browsers free of charge today. But both Microsoft and Netscape do so voluntarily in response to market incentives. Forced distribution of intellectual property is another, much more serious, matter.

Microsoft currently recoups its investments in Internet Explorer through fees from licensing the use of Windows. But if Microsoft could not retain control of the browser code, it could not tout IE as a feature that differentiates its operating system from others. In fact, as noted above, Microsoft could not even guarantee that IE would be included with Windows. Competitors, on the other hand, would have access to the IE code, so they could match the browser's capabilities on their own operating systems and other software platforms. Finally, with IE released as open source, OEMs could use the free IE code while licensing a version of Windows without IE at a mandated discount.¹⁹ Taken together, these factors would eliminate Microsoft's ability to recover its browser development costs via Windows licensing fees. Under these circumstances, why would Microsoft devote the resources to developing its browsers when doing so would only subsidize competitors? Incentives matter. Take away the prize from one competitor, and you destroy that competitor's incentive to compete.

Consumers would be harmed in a number of ways by the litigating states' open source provision. Clearly, Windows functionality would be impaired: several Windows features rely

source software disagree with this provision. For example, Lawrence Lessig, a professor at Stanford Law School writes: "While I am a strong supporter of the free and open source software movements ... I am not convinced the requirement of open sourcing Internet Explorer is yet required, or even effective." Lessig argues that the DOJ settlement already has "a strong requirement that application interfaces be disclosed, and until that remedy proves incomplete, I don't believe the much more extreme requirement of full disclosure of source code is merited." Testimony of Professor Lawrence Lessig, Stanford Law School, before the Senate Committee on the Judiciary at its hearing: *The Microsoft Settlement: A Look to the Future*, December 12, 2001.

¹⁹ The higher the cost of developing IE, the larger the mandated discount.

on APIs in Internet Explorer (such as the help system and Windows Update), and Microsoft would have no reason to improve these features in the future. Independent application programs rely on IE code as well. The World Wide Web will surely continue to develop and offer new products and services, but Windows and the applications running on Windows could be foreclosed from taking advantage of these new offerings.

Consider, for example, money management programs like Quicken that use IE technology to download current stock prices and online banking information without requiring the customer to exit the application program or to launch a separate program.²⁰ Banks and credit card companies would undoubtedly continue to enhance their Internet offerings, which would likely require browser modifications. IE would not be updated to take advantage of the new features, and a large number of consumers using Windows would suffer as a result. By the same token, media players, including RealOne by segment leader RealNetworks, often rely on APIs in IE. Media players relying on IE would have to implement their own ways to take advantage of new developments in Web technology. Again, consumers would suffer from reduced software functionality.

On the other hand, it is not clear how the proposed remedy would benefit consumers. If the development of IE stagnates, there is no assurance that the browsers from other software makers that replaced IE would be superior. What is clear, though, is that application developers would face stiff costs during the transition. They would have to redesign their software to access APIs in the browser(s) that replaced IE, or provide their own technology to access the Internet. Consumers would suffer during the transition too, doing without new products and features while waiting for some competing browser to dominate the market. And when the dust settled, consumers would no longer have the convenience of a browser integrated into the operating system.²¹

²⁰ See <http://www.shopintuit.com/Q2002/Consumer/QuickenFamily.ASP?PriorityCode=5010066>.

²¹ Industry analysts recognized the benefits to integrating IE and Windows. For example, see, Steven H. Wildstrom, "Why I'm Rooting for Microsoft: A Close Look at Its Browser Shows It Should Be Linked with the Operating System," *Business Week* 30, February 23, 1998.

C. Office Closing

Customers using application software suites would suffer a similar fate. The litigating states' proposal would require Microsoft to auction three licenses to adapt the business applications suite Office to run on operating systems other than Windows and the Macintosh.²² The winners of the auction would gain access to all of the source code for the Windows and the Macintosh versions of Office (separate products with different code bases), along with all the tools and testing suites Microsoft uses for Office, plus any source code in the Windows operating system "necessary for the porting." Any time in the next ten years Microsoft released a new version of Office, Microsoft would have to provide the new source code and tools to the auction winners. In return, Microsoft would receive only the one-time auction fee—no ongoing royalties and no fees for the upgrade information.

Assume that this aspect of the litigating states' remedy proposal was "successful" in the sense that substantial numbers of consumers were thereby induced to use the operating systems to which Office was ported.²³ Then the incentive for Microsoft to develop new versions of Office would be greatly reduced. First, the only form of compensation to Microsoft for the intellectual property contained in Office would be the initial auction fee. With non-Microsoft versions of Office available for other operating systems, Microsoft would no longer be able to market Office as an advantage of the Windows platform. Any future improvements Microsoft made to Office would have to be given away to the competitors winning the auction, so Microsoft could not differentiate its version of Office from the competing "Offices." Finally, any features of Windows that Office (current or future versions) used would trigger the requirement that the source code for those Windows improvements be turned over to the winners of the Office auction. All told, this would weaken Microsoft's incentives to develop Office because it would sharply reduce the return on Microsoft's investment.

Considering which competitors might bid at the auction further illustrates how little incentive Microsoft would have to develop Office. It is likely that one of the auction winners

²² Plaintiffs' proposal, at 11.

²³ If the remedy is not intended to be "successful" in this manner, then it is pointless. I therefore assume it would be "successful."

would port Office to a network server system (such as Sun Microsystems' Solaris) and use the software code and technical information Microsoft would be obliged to provide to make the server version of Office work on Windows "clients"—that is, end-user PCs. This amounts to a loophole to the provision assuring that Microsoft would retain exclusive rights to license Office for Windows and the Macintosh.

Another potential loophole involves cloning Windows. If the other provisions in the litigating states' remedies enable competitors to clone Windows, the non-Microsoft versions of Office could be ported to run on these clones. These two plausible scenarios, combined with the factors outlined above, would virtually eliminate Microsoft's incentives to continue developing Office.

Consumers would initially benefit from Microsoft's loss of its exclusive rights to license Office. The remedy would both allow access to Office on new platforms and, most likely, decrease the price of the Windows and Macintosh versions since Microsoft would face the threat of backdoor competition on its once-exclusive platforms. But these gains would be short-lived.

First, if the auction was successful and the ported versions of Office attracted users, Microsoft would cease to develop Office—either for Windows or for the Macintosh. Second, the benefits to consumers that come with de facto standards like Office would be lost. Since the auction winners would not have to release upgrades and feature enhancements to competitors (as Microsoft would), they would have every incentive to differentiate their versions of Office. Therefore, auction winners would most likely upgrade their versions with proprietary enhancements tailored to the relevant operating system or platform. "Office" would no longer have a consistent meaning. As a result, the network benefits—sharing applications files, moving easily among different computers, and finding software help and support—would be greatly diminished. Business users would face higher implementation, training, and support costs as well.

Without Microsoft in the driver's seat, improvements by competitors might drive innovation in Office. But this is far from guaranteed. First, the auction winners would not be

allowed to market their “improvements” for Windows versions of Office, so users of Microsoft’s operating system would not benefit from improvements to other versions of the suite. Second, the smaller scale of non-Windows platforms would limit the financial incentives of these competitors to improve their versions of Office. Given the scale economies in software distribution, smaller user bases could also translate into higher average costs. And, as noted above, until another suite became as popular as Office on Windows and the Macintosh platforms, users of Office would lose the network benefits of a de facto standard.

It is important to remember that Microsoft’s application suite became the most widely used for a good reason: consumers and reviewers agreed it was the best. The data collected from software reviews in five top computer magazines show that Microsoft applications—Access and especially Word and Excel—were recognized as among the best software applications since their first releases. By the mid-1990s software reviews singled them out as the best applications in their categories. Similarly, software reviews identified Microsoft Office as the best office suite.²⁴ In most cases, Microsoft’s products had to overcome long-entrenched market leaders in key categories, notably WordPerfect in word processing and Lotus 1-2-3 in spreadsheets.²⁵ So much for the idea that the most widely used software gives its producer permanent market dominance.

Microsoft worked hard, investing considerable resources to improve its applications programs to the point where they overtook the market leaders of the day. Ironically in light of claims that Microsoft exploited its ownership of the most popular operating systems, one key factor in the success of Microsoft’s applications for Windows was that they built on versions Microsoft originally developed for Apple’s Macintosh, where they were phenomenally successful. Consumers benefited from this aggressive competition.

²⁴ Software review data was collected from *PC Magazine*, *PC World*, *InfoWorld*, *Computer Shopper* and *Computerworld* for Microsoft applications and office suites, and covered all versions of Microsoft applications and 1994-2001 for Office.

²⁵ See David S. Evans, Albert Nichols, and Bernard Reddy, “The Rise and Fall of Leaders in Personal Computer Software,” January 7, 1999, available at http://www.neramicrosoft.com/NeraDocuments/Analyses/rise_and_fall.pdf.

However, under the litigating states' proposed remedy, Microsoft would have little reason to compete vigorously in application suites in the future. Consumers would be harmed by the resulting stagnation of Office, the fragmentation of the Office standard, and the transition (if the auction were truly successful) to a new de facto standard.

III. THE WORLD ACCORDING TO THE LITIGATING STATES

It is impossible to know how the software industry will change over the ten years that the states' restrictions would be in place. One can, however, get some insight into the potential impact by engaging in the following thought experiment. Suppose the litigating states' remedies had been put in place 10 years ago, after the April 1992 release of Windows 3.1. How would consumers be faring today?

Most likely, they would be worse off in a number of ways. First, MS-DOS would never have been integrated with the Windows graphical interface. So consumers wanting to migrate from the character-based DOS operating system while staying with a Microsoft product would have had to switch to a graphical operating system such as Windows NT, a separate operating system that did not run many MS-DOS applications. They would, therefore, have given up a great deal of backward compatibility, that is, the ability to work with files created with the earlier DOS software. Second, Windows NT would have fragmented into a confusing array of versions, as computer makers removed various combinations of "middleware." Third, the available versions of Windows would have offered little or no networking—let alone Internet—capabilities.

In the fall of 1992, Microsoft released its first version of Windows for Workgroups, in which the primary improvement to Windows 3.1 was the addition of peer-to-peer networking capabilities. Had the binding provision been in effect at the time, it would have led to potentially perverse effects. The networking capabilities would have been considered "middleware" since competing peer-to-peer networking products already existed. Microsoft would therefore have been forced to provide a version of Windows for Workgroups that lacked the networking capabilities—essentially matching the capabilities of Windows 3.1. And computer makers who chose Windows for Workgroups without its network capabilities would

have been entitled to a substantial discount based on development costs, probably limited only by the 25 percent cap for discounts.²⁶ Microsoft would have had diminished incentives to include this early—and popular—form of networking in Windows if the costs of developing such “middleware” had perverse implications for pricing.

In 1992 Microsoft had just released for beta testing a new, built-from-scratch operating system—Windows NT. This operating system was designed for use on advanced workstations and servers, but presumably it would have been more attractive to general consumers in the absence of any other Microsoft operating system for Intel PCs with a point-and-click interface.²⁷ However, Windows NT, which was based on new code, was much less backward-compatible with MS-DOS applications. In other words, old files and documents could not be moved as easily to the new operating system as to Windows 3.1. Consumers would thus have faced significant switching costs had they migrated to this new platform. These costs would certainly have slowed consumer migration from MS-DOS to Windows, depriving users of the well-recognized benefits of a point-and-click system over the old character-based DOS.

The effects of the litigating states’ proposal on the development of Windows NT would have been even more damaging to consumers. As discussed above, the prohibition on “middleware” binding, the mechanistic discount formula, and the intellectual property disclosure rules mandated by the plaintiff states would have had a devastating effect on Microsoft’s incentives to improve and ability to compete with its operating system.

Had the litigating states’ proposal been in effect in 1995, Microsoft would not have been able to integrate MS-DOS and Windows, as it did with Windows 95.²⁸ The Windows

²⁶ If Windows for Workgroups was considered a major upgrade to Window 3.1, and if the only difference between the two products was networking, then the required discount for Windows for Workgroups (ignoring the 25 percent cap) would have been 100 percent. Such a discount would mean that the “unbundled” version of Windows for Workgroups (i.e., Windows 3.1) would, absent the 25 percent cap, be free.

²⁷ IBM offered its own operating system with a graphical user interface for Intel-compatible PCs, OS/2, which in 1993 had the ability to run applications written for Windows 3.1. Had it been in effect in 1992, the litigating states’ proposal would no doubt have provided an artificial boost to the popularity of OS/2—by hobbling the development of Windows.

²⁸ Windows 95 combined what is called a real-mode operating system (based on, but different from, MS-DOS) with a protected mode operating system that included a graphical user interface superficially similar in some ways to the one in Windows for Workgroups. These two major components of Windows 95 relied on each other

portion of the operating system, which included a graphical user interface and exposed its own set of APIs, would surely have fallen under the litigating states' definition of "middleware." As explained above, had Microsoft attempted to license the Windows/DOS combination, licensees could have removed the Windows "middleware" piece and received a discount for doing so.

The operating system disclosure rules would have covered Windows as well, so the new APIs and portions of the new source code would have been available to competitors. Microsoft would have had little incentive to invest further in Windows because either it would have had to give new code and tools to competitors for free, or it would have been at a severe pricing disadvantage if it had tried to compete. With such limited opportunities for earning a return on its considerable development expenditures, the DOS-compatible version of Windows would have stopped with version 3.1.²⁹ Windows 95, an extremely popular and well-regarded operating system, would never have come to life.³⁰

By the same token Microsoft never would have developed its browsing software, because it is classified as "middleware" subject to the binding and pricing formula.³¹ Consumers would have been harmed because the many benefits that came from incorporating browser features into the operating system would never have been theirs. Nor would competitive pressure from Microsoft have spurred Netscape to improve its browser Navigator. Even Judge Jackson acknowledged that Microsoft forced innovation and improvements in browsers:

for specific functionality that was not present in other DOS-like operating systems or graphical user interfaces for such operating systems.

²⁹ Microsoft currently spends about \$4.4 billion on research and development. Microsoft Corp., Form 10-K for the fiscal year ended June 30, 2001. In fiscal year 1992, it spent about \$350 million. Paul Maritz testified in 1999 that about half of Microsoft's R&D expenditures are directed towards Windows. *United States v. Microsoft*, Civil Action No. 98-1232 (TPJ) and *New York v. Microsoft*, 98-1233 (TPJ), Testimony of Paul Maritz, January 22, 1999, ¶ 154.

³⁰ In 1998, for example, Windows 95 had a worldwide installed base of 123 million. William Peterson, "Client Operating Environments: 1999 Worldwide Markets and Trends," International Data Corporation, Report No. 19477, June 1999, Table 9.

³¹ Since IE did not exist in 1992, I assume that the open-source requirement for Microsoft's browsers would not have applied. Nonetheless, the same arguments given earlier about IE would still hold since browsers are middleware and subject to the binding, pricing, and IP disclosure rules. Microsoft would not have developed IE or MSN Explorer because under the plaintiffs' remedy the expected payoff would have been less than the development costs.

The debut of Internet Explorer and its rapid improvement gave Netscape an incentive to improve Navigator's quality at a competitive rate... These actions thus contributed to improving the quality of Web browsing software, lowering its cost, and increasing its availability, thereby benefiting consumers.³²

It is also quite possible that other features in Windows and in complementary products would not exist today, either, because they depend on the browser technology embedded in IE. For example, both the help system and the media player in recent versions of Windows rely on APIs in IE. This is also true of competitive media players. For example, RealNetwork's RealOne relies on APIs exposed by Internet Explorer, as do media players from other vendors.³³ Without access to the Web-browsing APIs, RealOne would have reduced features as compared to today.³⁴ Indeed, the Macintosh versions of media players, from RealNetworks and others, typically have less functionality than their Windows counterparts.³⁵ In addition to all of the "middleware" (including IE and media players) that Microsoft integrated into Windows, consumers would have given up a number of other beneficial enhancements that Windows incorporated after 1992.³⁶

One of Microsoft's strengths over the years has been its support of independent software vendors.³⁷ But in this scenario, supporting the development of applications for

³² United States v. Microsoft, Civil Action Nos. 98-1232 and 98-1233 (TPJ), Findings of Fact, November 5, 1999, available at <http://www.usdoj.gov/atr/cases/f3800/msjudge.pdf>, ¶408 (hereinafter "FOF").

³³ In addition to RealNetwork's RealOne, media players by Winamp and MusicMatch rely on APIs exposed by IE.

³⁴ They would have had to develop their own browser technology or gain access to similar APIs in Navigator. However, Netscape was slow to expose APIs in Navigator that software developers could rely on. See United States v. Microsoft, Civil Action Nos. 98-1232 and 98-1233 (TPJ), Testimony of James Barksdale, October 27, 1998 AM Session, p. 74.

³⁵ RealNetworks' newest media player, RealOne, is not available for the Macintosh. See http://www.real.com/realone/sysreqs.html?src=020305realhome_1. Neither is WinAmp. See <http://download.cnet.com/downloads/0-1896413-108-26164.html>. For Musicmatch Jukebox, compare: <http://www.musicmatch.com/info/features/index.htm?os=mac> (Mac) to <http://www.musicmatch.com/info/features/?os=pc> (Windows).

³⁶ For example, Microsoft would not have included the TCP/IP stack, which allowed Windows to include Internet capabilities. Nor would Microsoft have added standard networking protocols to Windows. Software for these features was available separately—but at a price. TCP/IP software cost around \$100. Moreover, adding networking software to the operating system greatly simplified the process for consumers (and, in the case of dial-up, for Internet service providers as well).

³⁷ Microsoft has a very high reputation as a strong supporter of independent software developers writing applications for Windows. Ana Volpi and Carol Monaco, "Developing Developers: Developer Support Program Dynamics and the Strategic Role of Developer Support," International Data Corporation, No. 23966, March

Windows would mean supporting the development of applications for operating systems that had cloned Windows features. Moreover, a provision in the litigating states' proposal would prohibit Microsoft from encouraging the development of Windows applications by providing sample code that was licensed for use only with Windows.³⁸ As a result, Microsoft would have little or no incentive to promote the development of applications for Windows. This could translate into less software, or lower-quality software, for the platform.

After ten years in effect, the litigating states' proposal would have essentially eliminated the Windows platform. Plaintiffs' would likely argue that this would have made consumers better off. Breaking Windows' "dominance," they would probably maintain, would have opened the doors for competition.

But this ignores the economics of the software market. Scale economies and network effects would almost certainly have led to the emergence of another dominant platform. And the transition to that new platform would have been extremely painful, particularly for application developers and consumers. Forcing intelligent customers to move away from products that they otherwise would freely choose to purchase and use is unlikely to be in their best interests.

IV. CONCLUSION

The litigating states' proposed remedy would result in consumer harm. In particular, their proposal would drastically reduce Microsoft's incentives to develop major products, including Windows (with its Internet Explorer and media-playing technologies) and Office. In fact, had the litigating states' proposal been adopted in 1992, Windows 95 and Internet Explorer would never have existed and Windows NT would have stagnated shortly after its debut.

Consumers would have paid a heavy price for the loss of the de facto operating system standard. In addition to the costs incurred during a transition from MS-DOS and Windows to

2001; Steve Lohr, "Microsoft Puts Its Muscle Behind Web Programming Tools," *New York Times*, February 13, 2002.

³⁸ Plaintiffs' proposal, p. 15. #6b

other operating systems not hamstrung by regulation, consumers could have ended up with fewer features, less choice of software and software suppliers, and higher prices. The ultimate test a proposed antitrust remedy must pass before it is adopted is whether it enhances consumer welfare. By this test, the proposal put forth by the litigating states fails dramatically.